

A CASE IN SOUTH AFRICA OF OCULAR MYIASIS IN MAN DUE TO THE FIRST-STAGE LARVAE OF THE NASAL BOT FLY OF THE SHEEP (*OESTRUS OVIS* L.)

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On 16 October 1959 one of the members of the staff of the Veterinary Research Institute at Onderstepoort while walking within the grounds of the institute at about 11 a.m. experienced sudden intense irritation in the right eye and complained of feeling a moving object under the upper lid. Upon examination a small white maggot-like larva was clearly discernible moving fairly rapidly over the sclera. Attempts at irrigating the sclera with normal saline with the object of washing out the larva failed to remove it and it was finally extracted by means of a pair of fine-pointed forceps. The irritation, however, persisted and the patient stated that he was aware of further movement over the sclera, especially the medial canthus. As superficial examination failed to reveal any further larvae present, and by this time a fairly severe conjunctivitis had set in he was advised to consult an ophthalmologist. Upon the patient's arrival at the consulting room the affected eye was subjected to close scrutiny.

With the naked eye nothing could be detected. On $\times 16$ magnification with the corneal microscope and slit lamp the larvae could be seen clearly in the upper and lower fornix, hiding in the conjunctival folds. As soon as they were exposed by manual eversion of the conjunctival folds they moved away from the light at a speed of 1 cm. in two or three seconds to disappear in another fold of the fornix.

The larvae are about 1 mm. long and 1/3rd of a mm. wide, and of a slightly fleshy colour. They have a number of hooks which hold tightly to the conjunctiva. They prefer to hide in the upper fornix.

After a local anaesthetic was instilled into the eye, irrigation was attempted with a plastic bottle. A strong stream of water was squirted into the fornix several times but with no success. Removal was then accomplished with the aid of the slit lamp and $\times 16$ magnification. Small non-tooth forceps were used to catch each larva as it passed the eye field. Eight larvae were removed.

One larva removed from the eye was mounted and examined microscopically; it proved to be a typical first-stage larva of *Oestrus ovis* (Fig. 1).

It is of interest to record that at no time was the patient aware of the presence of an adult fly, the first indication being the irritation and the awareness of movement over the sclera. The method by which the larvae could have been introduced into the eye remains an open question; the patient gave us the assurance that he had had no contact with sheep during the course of the morning. Large numbers of sheep are present at Onderstepoort and infection among them by the larvae of the nasal bot fly is a common occurrence. It was finally concluded that the living larvae had been introduced into the eye by an adult fly unknown to

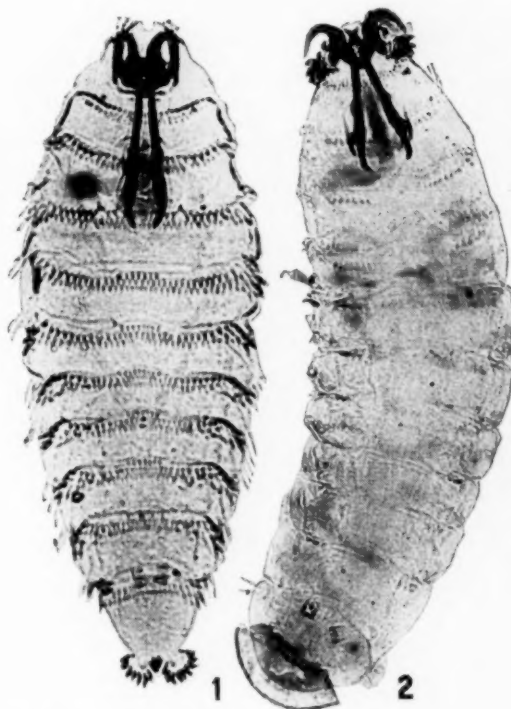


Fig. 1. *Oestrus ovis*. First-stage larva.

Fig. 2. *Gedoelstia cristata*. First-stage larva.

the patient, according to the habit displayed by the species in attacking sheep, where it has been observed that the female fly hovers near the nostrils of the animal and darts in to deposit living larvae on the external nares without actually alighting.

A perusal of the literature has revealed that infection of man is a common occurrence in countries bordering the Mediterranean sea. Sergeant (1952), in summarizing the occurrence of oculonasal myiasis in man due to *O. ovis* in Algeria, appears to have been the first to record the infection, as far back as 1907, and mentions that it is a quite common occurrence in the mountainous regions where the human population is large in relation to the sheep population, but rare where the reverse is the case. Favier (1958) records a case of oculonasal myiasis from the same area (Southern Oranais). Keiser (1949) describes the first case

in man from Switzerland. Mazina (1948) describes a case of acute proptosis which resolved when the larva of *Oestrus ovis* had appeared through a fistula in the upper lid. Infestation of a socket and nasal cavity after an enucleation was recorded by Martino (1947).

James (1947) records the infection in America. Basu *et al.* (1953) record 4 cases in man from India, where the strikes occurred on the nostrils. Pampiglione (1958) carried out extensive investigations and reports upon the condition as being of common occurrence particularly among shepherds; in Sardinia, of 414 human cases investigated 50% had been attacked and of these 77% were in shepherds; in Italy 101 shepherds were interviewed, of whom 85.6% reported having experienced one or more infections. This author records infection by the larvae of *Oestrus ovis* in the upper respiratory tract involving oral, nasal, tonsillar, pharyngeal, laryngeal and aural as well as ocular myiasis.

Among the records cited, the authors have stated that in cases where treatment or mechanical removal of the larvae had not been applied the infection cleared spontaneously after the lapse of 3 - 10 days and in no case did the larvae develop beyond the first stage nor did there appear to be any tendency on the part of the larvae to penetrate deeply into the tissues.

GEDOELSTIA LARVAE

Of a somewhat different nature is an infection among domestic stock, including sheep, cattle and horses, which has been the subject of investigation for some years in the western dry regions of the Union of South Africa and eastern parts of South West Africa. This infection, which has been referred to locally by the Afrikaans name of *uitpeuloogsiekte* (bulging eye disease), occurs in epizootic form only when, owing to drought as a rule, intermingling of game animals, blue wildebeest (*Connochaetes taurinus* Burch.) and hartebeest (*Alcelaphus caama* Curr.) with domestic stock occurs. First-stage larvae of two oestrid flies, *Gedoelestia hassleri* Ged. and *G. cristata* Rod. & Beq. have been recovered from various organs of the stock and appear to be definitely associated with the epizootic condition. One human infection has been recorded from the Kuruman district, where a specimen of *G. cristata* was captured after it had deposited large numbers of larvae in the external ear.

In the cases recorded in stock the first-stage larvae (Fig. 2) have been recorded from the anterior chamber of the eye, the coronary arteries, and the lungs, where they have been associated with extensive thrombus formation and inflammation of the surrounding tissues along fairly clearly defined tracks. Similar inflammatory tracks had been noted in the meninges and brain tissues, although attempts at recovering larvae from these situations have as yet yielded negative results.

In contrast to the habits of the first-stage larvae of *Oestrus ovis*, which display little or no tendency to penetrate into tissues, the larvae of the *Gedoelestia* species exhibit similar tendencies to those of the warble flies, *Hypoderma* species, which commonly

attack cattle in Europe and America, penetrate into the subcutaneous tissue, and migrate extensively to remote regions of the body. The larvae of *Gedoelestia* appear to penetrate deeply into the tissues in the vicinity of the situations in which they are deposited, generally the conjunctiva, and in this way apparently enter the blood stream, which would account for their presence in the situations noted. In their definitive hosts, namely, wildebeest and hartebeest, they occur normally in the frontal sinuses of the head, where they undergo two edyses and are expelled after reaching the third stage, to undergo pupation in the ground and ultimately produce adult flies. In a number of wildebeest which have been examined recently it appears to be a regular finding that first-stage larvae can be recovered from the subdural space in the region of the olfactory lobes of the brain, having gained entrance presumably via the turbinate bones and ethmoid meatus (Basson 1959). In all cases, however, no evidence of destruction of tissue or the presence of inflammatory reactions has accompanied the finding of the larvae in these situations, which would appear to indicate that this may constitute a normal phase of their development cycle in these animals.

Conclusion

The human infection with *Oestrus ovis* recorded here appears to be the first case encountered in the Union of South Africa so far as medical literature is concerned, although the species is widespread in this country (du Toit 1956), and demonstrates the importance of scrutinizing all irritated eyes with a high magnification in the fornix. By this method this condition may be discovered more frequently, especially in sheep areas with many flies, even under normal hygienic conditions.

SUMMARY

A South African human case of infection of the eye with the first-stage larvae of the nasal bot fly of the sheep (*Oestrus ovis*) is described. This appears to be the first case recorded in the Union.

The literature recording similar cases in other parts of the world is cited.

Reference is made to myiasis with *Gedoelestia* species in blue wildebeest and hartebeest, which occasionally occurs in epidemic form in sheep, cattle and horses, and has been recorded in one case in man in the Kuruman district.

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RECENT DEVELOPEMENTS IN AVIATION MEDICINE*

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Space medicine is the key to man's survival in a new dimension and it represents his only hope of staying alive in the hostile environment of space.

A great deal of research and development in the related field of human and rocket engineering has now made it possible for informed medical opinion to hold that manned-space flight is not only a possibility but a distinct probability. A review of the known physical and psycho-physiological barriers to space flight showed that none of these are apparently insuperable and that space flight of short duration in the region surrounding the earth is in fact currently possible.

With a view to placing these problems in true perspective, 3

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important factors affecting space flight were discussed: (1) Physical-environmental factors of space; (2) speeds of space vehicles in relation to linear, angular, and radial acceleration; and (3) distances space ships will travel over and away from the earth.

The medical problems to be encountered by man in space were discussed with reference to the protective devices that will enable space-ship crews to function in the prescribed physiological limits of pressure, temperature, and atmospheric condition. An indication was given of areas where further research is necessary before inter-planetary space flight can become a reality. Reference was made to the problems of weightlessness, spatial disorientation and various psychological factors like the "break-off" phenomenon.

In conclusion a time table was given of the American Space Flight programme to indicate the estimated future rate of progress.

VAN DIE REDAKSIE : EDITORIAL

DIE NARKOTISEUR SE BYDRAE TOT DIE WELSYN VAN DIE PASGEBORENE

Niemand weet presies waarom die pasgeborene hoegenaamd begin asemhaal nie. Slegs oor een aspek van die saak stem almal egter saam: 'n gevorderde mate van anoksie bevorder waarskynlik nooit enige asemhalingsbewegings nie. Alhoewel Henderson¹ in 1938 beweer het dat verstikking van die pasgeborene uit 'n gebrek aan sowel suurstof as koolstofdioksied bestaan, was Barcroft² in 1946 een van die eerste om tereg te glo dat koolstofdioksied wel stadig maar seker ophoop in die bloed gedurende die eerste twee uur van ons buitebaarmoederlike bestaan. Dit is sedertdien bevestig dat so 'n vermeerdering in die spanning van koolstofdioksied weinig of geen invloed op asemhaling uitoefen nie, en dat die suigeling sy lewensbelangrike prestasie van veeleisende asemhalingsbewegings behaal te midde van 'n lae, normale, of hoë koolstofdioksied-spanning.³ (Twee tot 24 uur na geboorte reageer die asemhaling egter reeds kragtig op stygende koolstofdioksied-spanning in die bloed.) Macklin⁴ het die intieme verhouding beskryf tussen uitsetting van alveolêre kapillêres en alveoli, oor die algemeen, maar Jäykkä⁵ was die eerste om in 1954 die interessante hipotese voor te stel dat die intrede van die pulmonale sirkulasie op sigself alveolêre uitsetting bewerkstellig deur die totstandkoming van kapillêre opswelling.

Die sterftesyfer van suigeling gedurende die eerste week, veral gedurende die eerste twee dae, bly nog steeds konstant, grotendeels as gevolg van gebrekkige asemhaling. Dit is so in treffende teenstelling met die indrukwekkende vooruitgang van die lewensverwachting na die eerste week.⁶ Miskien moet hierdie feit grotendeels toegeskryf word aan die relatiewe onryp morfologie van die longe in vergelyking met dié van die hart van die pasgeborene⁷—'n toestand van sake wat ongekontroleerde kunsmatige asemhaling met behulp van positiewe druk uiters gevaarlik maak, soos Ehrenhaft en sy medewerkers gevind het in drie gevalle van toenemende emfiseem.⁸ Nogtans is ons heel eerste asemteug ook verreweg ons moeilikste.⁹

Alhoewel amnionvog gereedlik in en uit die longe van die fetus beweeg, is die negatiewe druk wat nodig is om slegs die oppervlakte-spanning te oorwin ten tyde van die eerste asemteug, 15-20 cm. water. Om die elastiese weerstand boonop die hoof te bied, is daar gevind dat 'n totale negatiewe druk van 40 cm. water dikwels nodig is.

Die Amerikaanse narkotiseur, Tovell, het kort na die laaste oorlog reeds voorgestel dat spierslappers aan pasgeborenes toegedien word, sodat hul deur 'n endotracheale buis noukeurig afgemete getylug onder druk kon ontvang. Alle narkotiseurs stem vandag saam dat pasgebore babas 'n endotracheale buis sonder enige narkose of spierslapper verdra, maar, nes ouer slagoffers van poliomiëlitis, is dit moontlik dat spierslappers tot beter kontrole van kunsmatige asemhaling mag bydra, alhoewel daar in die geval van pasgeborenes tot vandag geen bevestiging ter hand is nie. Lord en sy medewerkers¹⁰ het wel die waarde van endotracheale afwisselende positiewe druk bevestig in die behandeling van verstikking van die pasgeborene, maar dit is dringend noodsaaklik om daarop te wys dat die vitale

kapasiteit meer as 160 ml. mag bedra met 'n rustende getylug, in voltydse pasgeborenes, van slegs 21 ml., en sowat 11 ml. in vroeggebore babas.¹¹ 'n Spesiaal-voorbereide konsertina of soortgelyke reserwesak met bepaalde afmetings en indien moontlik ook toegerus met 'n manometer en boonop die vermoë om druk uit te oefen vir slegs 'n klein breuk van 'n sekonde, is dus 'n vereiste.¹²

Jackson¹³ gebruik die alledaagse chirurgiese rubberhandskoen as reserwesak. Direkte mond-op-mond inblasings (met die gebruik van slegs wange en sagte verhemelte) is al eeue in gebruik met verbasend goeie gevolg¹⁴. Beric Jackson, van Durban, en sy kollegas¹⁵ het goeie resultate behaal met 'n eenvoudige en handige masker, sfigmomanometer, en 'n reserwesak met 'n inhoudsmaat van 20 ml. Ingewikkelde apparate sluit in die 'Heidbring Infant Resuscitation Apparatus' en die 'Infant Oxygen Rocker (Roberts-Talley)'. Donald¹⁶ het gevind dat die ysterlong-tipe kunsmatige asemhaling misluk in die pasgeborene weens laasgenoemde se wisselende vorm en die mate van die borskas. Hy glo boonop dat, soos die *Lancet*¹⁷ reeds in 1953 kon berig, alle apparate vir kunsmatige asemhaling by die pasgeborene op slegs een beginsel behoort te berus, naamlik, op ondersteuning van reeds bestaande asemhaling liewers as op wedywing met die ontoereikende pogings van die baba. Dit bring ons weer by die probleem of spierslappers voordelig sal blyk.

Een maatstaf wat vandag oor die lengte en breedte van Amerika in gebruik is, sal definitief daartoe bydra dat meer eenstemmigheid bereik word op hierdie netelige terrein van die pasgeborene se asemhaling; dit is Virginia Apgar se sogenaamde 'telkaart'.¹⁸ Hierdie narkotiseur wag 60 sekondes na die algehele geboorte (die geboorte van die naelstring en nageboorte word nie in ag geneem nie), en gee dan 0, 1, of 2 punte aan ieder pasgeborene al na gelang die volgende 5 tekens:

Teken	0	1	2
Hartspoed	Afwesig	Stadig (Minder as 100)	Meer as 100
Asemhalingspoging	Afwesig	Swak, huil. (Hipoventilasie)	Goed; Lekker skreeuend
Spiertonus	Pap	Ietwat fleksie van ledemate	Duidelike fleksie
Refleks-prikkelbaarheid	Geen reaksie	'n Mate van beweging	Lekker skreeuend
Kleur	Blou, bleek	Liggzaam pienk; ledemate blou	Pienk van kop tot tone

Refleksprikkelbaarheid word op sy beste bepaal deur 'n flink klap loodreg op die voetsool. Van al die genoemde tekens is die eerste twee, hartspoed en asemhalingspoging, die enigste werklik belangrike. Een of ander vorm van doeltreffende asemhalingsondersteuning is aangedui met 'n telling van vier of minder. (Diegene wat gewone rubber gebruik kan slegs 'n druk van 20-30 cm. water behaal, omdat rubber teen dergelyke spannings begin rek sonder enige verdere

toename in druk.¹⁹ Alhoewel hoër druk gevaarlik is wanneer dit uitgeoefen word vir langer as sowat 'n vyfde van 'n sekonde,¹² is die druk wat behaal kan word in 'n gewone chirurgiese handskoen¹³ waarskynlik geheel en al ontoereikend, alans by die pasgeborene met apnee.

Die uniformiteit en moontlikheid van geldige vergelykings wat sal volg op die algemene gebruik van bogenoemde skema moet mettertyd lei tot 'n beter kennis van die waarde van al die teenstrydige metodes van behandeling ten opsigte van verstikking van die pasgeborene. Op dié manier behoort ook die verwarrende bewerings van Bloxson²⁰ verhoed te word in die toekoms. Bloxson het naamlik 'n reinigingsmiddel ('detergent') en 'n 'spreidingsfaktor' met beweerde sukses toegepas saam met sy sogenaamde 'air lock'. Teoretiese gebrekkighede is egter gevind deur sewe van tien deskundiges wat geraadpleeg is,²¹ en 'n behoorlik beplande ondersoek²² het absoluut geen voordele van Bloxson se voorstelle geopenbaar nie. Åkerén²³ se metode van intragastriese suurstof het veel van sy vroeë gewildheid verloor ook as gevolg van teoretiese besware en die feit dat dit die gevaar van maagruptuur inhou.²⁴ (Vir behoorlike gebruik is 'n dubbelbuis dus noodwendig; vir diegene wat glo dat 'n maagbuis in ieder baba na 'n keisersnit gebruik moet word,²⁵ is die metode egter baie handig.)

Die narkotiseur se oogpunt, soos hier uiteengesit, neem nie in ag die behandeling van pneumonie soos soms aangetref

word na langdurige membraanruptuur of ander pediatriese toestande nie. Nogtans behels dit 'n benadering wat 'n groot bydrae lewer tot die nog steeds onopgeloste probleem van 'n onveranderde en aansienlike sterftesyfer gedurende die eerste week van menslike bestaan buite die moeder.

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THE SECRETARY FOR HEALTH

Early in August Dr. J. J. du Pré le Roux will retire from the position of head of the Union Department of Health, which he has held with great distinction since 1952. During his term of office important advances have been made in the administration of preventive medicine in this country. In the achievement of these Dr. le Roux's enlightened wisdom and vigour have played a vital part, and South Africa owes him a debt of gratitude. As head of this Department he will be greatly missed by his professional bretheren, for cooperation has been the keynote of his administration. The President of the South African Medical and Dental Council has given eloquent expression to that Council's appreciation of the excellent and fruitful relations that have been maintained with successive Ministers of Health through Dr. le Roux's mediation. 'Dr. le Roux' said Professor Oosthuizen, 'had been a tower of strength'. The Medical Association of South Africa will heartily agree with this appreciation, for under Dr. le Roux's administration the Association, too, has been able to cooperate harmoniously with the Department and the Ministers in national health affairs.

A fundamental condition of successful health administration is a close liaison between the medical profession and the Department of Health; and to maintain this relation it is most advantageous that the head of that Department should be a medical practitioner understanding the problems of the public health and speaking the language of the profession.

The position that Dr. le Roux has held is in a formal sense a dual one, in that it combines the statutory office of Chief Health Officer (a post which under the Public Health Act of 1919 can be held only by a medical practitioner with

prescribed additional qualifications in public health) and the administrative office of Secretary for Health, which, though it carries with it the position of head of the Department of Health and accounting officer, does not require its incumbent to be qualified in medicine. Great concern has been caused in the profession by a report from a political correspondent that *Die Burger* has published,¹ viz. that the possibility is being mentioned 'in official circles' that the position, now that it is being vacated by Dr. le Roux, may be divided into two separate posts, — an administrative head 'who will be able to control administrative and financial matters' and a professional head 'who will be able to make expert professional decisions'.

Evidently the idea is similar to that which arose in 1940, at the time of the appointment of the late Dr. Peter Allan as Secretary for Health. A proposal was then under consideration to appoint a lay Secretary for Health as head of the Department of Health with a Chief Health Officer of lower administrative authority than head of department. The Association strongly opposed this proposal, with the result that the proposal was dropped and Dr. Allan was appointed as Secretary for Health and Chief Health Officer.

It may be that the idea ventilated in *Die Burger* (and elsewhere) is in the nature of kite-flying; but should it turn out to be a serious proposal it is to be expected that the Medical Association will again express its strong opposition. It will in no wise object to the salutary principle that the Government of the country should be in the hands of statesmen, and not professional experts, but it holds the view that in matters of health the structure of Government should be a Cabinet Minister with a medical head of a Health Department who should be responsible to the Minister

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for the work of the Department and for the carrying out of the policy of the Government. No matter what may be suitable administrative arrangements for other State departments, the department that is responsible, so far as Government functions extend, for the health of individual citizens (for that is what makes up the public health) should be under the direction of a competent medical officer, who should be immediately responsible to the Minister, without the intervention of a lay civil servant. The background of public-health administration is the science of medicine, with its basic sciences and associated professions, and this structure of government which, it may fitly be mentioned in this Jubilee year, has been in operation since the passing of the Public Health Act, is the best suited for the health administration of the Union Government. Moreover, it is the best calculated to bring the medical (and allied and

auxiliary) professions into that contact with the Government that is so valuable on questions of health.

It goes without saying that in any Government department, administrative and financial matters require expert handling, and a health department is no exception; indeed experts in other non-medical matters may be needed on the staff. This need give rise to no difficulty; the services and advice of the various sub-heads will of course be available to the head of department. The view of the Medical Association of South Africa, expressed in 1940, is that the health needs of the public require that the head of our Union Health Department should be a medical officer in touch with the realities of the public health and not a lay financial and administrative officer. The tail should not wag the dog.

1. *Die Burger*, 13 June 1960.

SURGICAL CONVALESCENCE*

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Surgical convalescence is of vital importance on a personal, social, and economic level to everyone concerned with an operation, especially the patient, his family, his employers, and the community in which he lives.

It is, fortunately a normal occurrence.

A constant review of ideas which seem easily acceptable, of procedures which seem obvious, and of syndromes which seem commonplace is necessary to appreciate the unusual, the abnormal, or the new. A simple example of this is early, controlled, post-operative activity. Where John Hilton said, in his writings on rest and pain, 'under injury, pain suggested the necessity of, and indeed compelled . . . rest', we say today that pain suggests the necessity of the limitation of activity only to the extent that this causes something more than discomfort.

General reading of the works of Hardy,^{9,10} from the University of Mississippi, and of Dunphy,^{14,15} and above all of Moore^{4,11,12} and the Harvard school, suggests that surgical convalescence may be reviewed under the heading of 6 questions: When does it start? Whence come the stimuli for the whole response to injury? Where lie the origins of the whole syndrome? What are the landmarks of its normal progress? How can we aid the whole process to follow its normal course? and, When does it end?

In surgery it is always well to consider the end before embarking on the beginning. Let us start, therefore, with the question: When does convalescence end?

Objectively, convalescence ends when the patient has returned to a normal physical and psychological state of well-being, of effort potential, of resistance to fatigue, and to a state of normal social relationship and of economic usefulness.

Subjective convalescence may coincide with objective convalescence, but the patient carries a scar to the end of his days . . . a sensitive-to-the-weather, touchy, or even

adherent scar . . . and is never quite the same after the operation. So, although healed to a tensile strength even beyond that of nearby tissue, the wound remains an area of continuing, special metabolism. In experiments on the recovery of the tensile strength of fascia in wounds, Douglas¹ shows that this process continues for at least a year (Fig. 1).

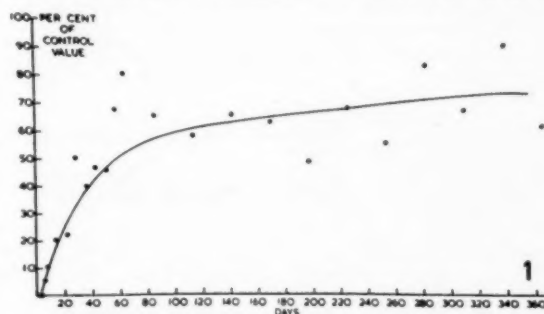


Fig. 1. The continuing recovery of tensile strength in a wound.

In this connection the breaking down of wounds in severe scurvy during the long sea-voyages of exploration comes to mind. In 1772 Lind showed that fresh fruit-juices could prevent such afflictions as beset George Anson in his circumnavigation in 1748, when he recorded that ' . . . old wounds, long healed, broke out afresh', and that ' . . . the callus of a broken bone that had been formed for a long time, was found to be completely dissolved'.

When does convalescence begin? Although it cannot begin before accidental injury, it may, and should, begin before elective surgery. This should be the point of commencement of return to psychological normality.² The sufferer's complaints have been patiently and sympathetically explored, his questions answered simply, as far as possible, and his fears have been rationalized. Not every shoal of differential diagnosis, nor treacherous current of prognosis, nor adverse wind of complication has been

* Paper presented at a meeting held under the auspices of the University of Cape Town and the Association of Surgeons of South Africa (M.A.S.A.) at Groote Schuur Hospital, 7 April 1960.

mentioned in discussion, but he is allowed to realize that a course of treatment is laid, a mark is in view, and a pilot has been picked who is competent and who, although aware of his limitations, will never give up the ship.

This pre-operative rapport is most important when it comes to guiding the patient's own evaluation of his post-operative progress, whether in exploring his increasing ability, or in correcting any fearful, needless, or even superstitious self-imposed limitation of activity.

Man's actions may be wise or they may be foolish, futile and self-defeating, but they are not without purpose. For example, a type of person, whom we all know too well, has an attitude of fantasied atonement for fantasied guilt towards pain and disease, and approaches an operation fearful of injury but confidently expecting it. Such a person awakes convinced that the day of reckoning has dawned and, even though he is apparently doing well, feels that he is liable to all sorts of complications and to permanent weakening of his constitution. He seemed stupidly difficult to convince of the obvious need for an operation for a hernia or a gastrectomy in the first place, and now the surgeon is sorry that he ever tried! If he didn't establish firm contact pre-operatively, he has no hope of achieving it now. In case it is felt that this psychological preparation for physical stress is exaggerated, it may be well to recall that Hill and others³ found that the coxswain and coach of the Harvard boat in 1953 and 1954 gave just as much evidence of adrenal cortical activity as the rowers themselves after a 4-mile race. Adrenal cortical activity, incidentally, interferes with the normal contraction of a wound—which will be mentioned later—as does excess secretion of thyroxin which may of course accompany the excited state.

Physical convalescence commences with the act of wounding. The severity of the wound and the size of the definitive

procedure will modify the duration of the whole response, and so will sepsis, haemorrhagic oozing and, in trauma, imperfect wound cleansing. Removal of body fluids by enteral drainage, especially if done to an injudicious extent, and fistulous depletion will also modify the course of convalescence.

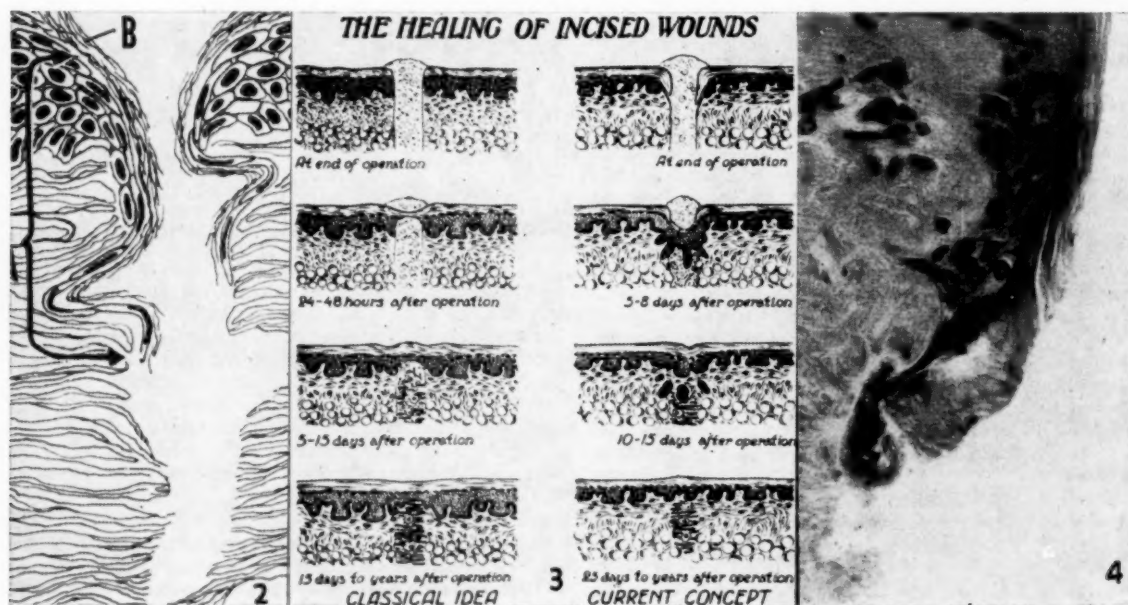
What are the landmarks of the normal progress of convalescence, whence come the stimuli for the response, and where lie the origins of the whole syndrome? According to Moore⁴ there are 4 phases, viz. (1) The phase of injury, (2) the phase of returning biochemical balance or homeostasis, (3) the phase of spontaneous nitrogen anabolism and returning muscle strength, and (4) the phase of fat gain and restoration of normal healthy weight.

Some aspects of these phases will now be surveyed in terms of (1) the clinical picture, (2) the picture of the wound itself, (3) the biochemical picture, and (4) the features in the clinical management most likely to affect helpfully these natural, normal processes.

The First Phase

In the first phase the patient is weak, thirsty and listless. He has no appetite, and the limit of his ambition is to avoid pain, to sleep, and to feel a little better than he did some short hour ago.

The wound accumulates an amorphous coagulum of clot, lymph solution, fibrin, leukocytes—especially monocytes—and large immune-protein bodies which are an important part of the matrix of the future collagen and fibrous tissue. There is variable bacterial contamination even under ordinary strict aseptic conditions. The very act of wounding cells has liberated hexosamine, to which reference will be made later. No collagen is detected and no polyblasts, fibroblasts, histiocytes, etc. are found on using the Edwards⁵ sponge sampling method.



Figs. 2, 3 and 4. See text.

Biochemically, however, the healing of the wound has now commenced, although the last-mentioned cells appear in greater numbers from the first day onwards. There is no biological 'lag period'.

Hartwell's 'Law of epithelium'^{6,23} commences to operate, and the epithelial cells move down each side of the wound to its depth, covering the raw surfaces. They do this by extending themselves elliptically, by pseudopodic extensions, and by a rolling movement. They do not multiply in number. There is no epimorphosis; there is only morphallaxis (Figs. 2, 3 and 4).

The technique of incision and dissection, and the accuracy of apposition and correct tension of stitching greatly influences this stage.⁷ The incision has damaged and dislocated tens of thousands of cells and mingled the intra- and intercellular, and the intravascular contents, and has given rise (amongst other things) to possible auto-immune sensitization effects—an extreme example of which may be found in operations for hydatid disease if anaphylactic shock is precipitated.

Biochemically the patient is retaining water and sodium by withdrawing them from the renal tubules.⁸ He is losing potassium, fat, and, fastest of all, his lean muscle mass, which, with his liver, is his greatest protein storehouse.

To explain this correlation of local and systemic response, hormones,⁹ 'feed-back mechanisms',¹⁰ or 'mediators'¹⁴ have been postulated.

What are mediators, what do we know about them, and what are their effects? We don't know what they are; we therefore know very little about them, but Moore¹¹ discusses their manner of action in the way which seems currently most likely to be clinically helpful. When all this limited knowledge and intelligent guesswork are used as the basis of management of the first phase of convalescence, whether normal or abnormal, we find our results superior to those obtained when we had even less information or more limited ideas to guide us.

'Convalescence is driven by an endocrine engine', said Moore,¹² and in Table I an attempt is made to summarize the concepts which are expressed in different works by Moore, Hardy, and others. It seems that there are endocrine mediators, which, in convalescence, predominate over non-endocrine mediators of the wound itself. The whole process may be likened to a sort of surgical physiological Manichaeism—the endocrine mediators are the principle of good and counter homeostatic tensions, while the non-endocrine mediators of the wound are the principle of evil and cause, enhance, and prolong these tensions.

The clinical management of the first phase commences with the proper preparation of the patient for operation, from his psychological outlook to his intracellular electrolytes and his body-fluid contents and their relative proportions, in order to prevent or diminish non-endocrine mediator activity and to give a fair start to what Deaver expressed as 'Cut well, sew well, get well'.

When pre-operative restoration of fluid volume, blood cells, electrolytes, and vitamins has been brought to the best level attainable for the particular patient in the judgment of the surgeon, the sooner the infection, the injury, or the tumour is dealt with, the better. This will avoid an increase of the hazards of toxæmia, tissue anoxia, liver damage, renal damage, and protein, glycogen, and fluid

TABLE I. THE WOUND. FACTORS IN SURGICAL CONVALESCENCE

Infection	Severity	Poor technique	Imperfect cleansing
	↓		↓
	Wound mediators—non-endocrine		Neuro-endocrine activation—endocrine mediators
1. Loss of normal skin or visceral barrier due to: (a) Infection from outside, and (b) fluid loss from inside.			1. Medullary epinephrine and synaptic nor-epinephrine control vasoconstrictor response to absorption of the toxæmia (a) of infection, and (b) 'tissue destruction metabolites', and (?) control of the ACTH response as shown by the eosinopenia for 2 days.
2. Actual cross-sectional tissue destruction, (a) by accident, and (b) by operative trauma of all types, especially coarse handling.			2. The antidiuretic hormone partly controls dehydration, especially in poorly-hydrated subjects, and combines with and subsidizes the action of:
3. Oligæmia due to (a) reactionary local oedema at wound, (b) reactionary diapedesis of fluid, e.g. from much handled or damaged peritoneum, and (c) haemorrhage uncorrected giving inefficient organ function, e.g. kidney, liver, brain; and accumulation of abnormal metabolites, which may contribute to:			3. The 17-hydroxyketosteroids which control nitrogen-metabolism ¹³ all the better if their function is not diverted to help fluid control, and if there is no cortical focal lipid depletion as in septicæmic infection (Stoner ²⁷).
4. Release of intracellular solutes, e.g. enzymes, potassium, etc. into the circulation, and of intravascular immune bodies and other large protein molecules into the tissues, with genesis of auto-immune reactions and anaphylaxis.			4. The aldosterones which are prime movers in fluid retention, and which determine sodium, potassium, and ? other electrolyte values.
5. Alteration of intestinal motility (Hardy ²⁴). Alteration of intestinal absorption (Howard ²⁵). Alteration of gall-bladder function (Howard ²⁶). Alteration of insulin control with stress glycosuria. All leading, in effect, to starvation.			5. The corticosteroids which may mediate the development of auto-immune bodies, and wound contraction (Grillo ²⁸).
6. Hypoxia. ?Impaired vital functions with increase of (2), (3) and (4) above, in gross trauma.			

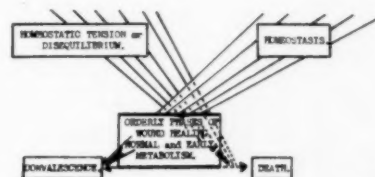


Fig. 5. Graphic representation of factors involved in surgical convalescence.

wastage, which may lead to what Moore calls an 'accretion of biologic components' of such an extent that the very survival mechanisms, e.g. the mobilization of cell-water, will hasten death.

The technique of operation must aim at asepsis, and a constant attempt should be made to damage all tissues as little as possible whether by clamping, crushing, tying, or burning. It should be remembered that an operation is a particular procedure, devised to meet the particular needs of a particular person, even though it follows a general pattern. Sympathy with this approach may bring happier results than adhering to a preconceived idea of a theoretical maximum operative clearance. (As Thomas Fuller might have said, 'the eagle's eye may have to prevent a lion's heart from causing a lady's hand to grab more than it can deal with'.) Soiled wounds and cavities, if unavoidable, must be cleaned and a drain should be used. Stitches and apposition will be mentioned later. To sum up, we may say that the local load of homeostatic response must be lightened to avoid strain upon and depletion of the patient's general endocrine and metabolic resources in favour of the merely local needs.

In the first phase of post-operative care, adequate relief of pain is the most important matter. Sleep, too, is important, but when pain is relieved sleep comes easily. Fluid balance is very simple, provided the temptation to find and then to fill some—usually fancied—endocrinal, electrolytic or protein need is resisted. The routine use of prophylactic antibiotics is wrong. If there are reasonable fears about the asepsis of a wound, then a small corrugated drain is a much better protection. In view of the value of early movement, and the fact that a small ooze of blood into the superficial tissue may result, this drain may be regarded as a double safety valve. Patients should move freely, as soon as possible, and up to the limit of comfort—short of causing actual wound pain.

In many of the very extensive and prolonged modern procedures all these factors demand exacting care for a few days until the end of the first phase. When new theatre accommodation is planned the provision of a post-operative intensive-therapy ward should be considered, where patients who have undergone major surgical operations could spend their first few days. This would lead to great economy in the

services of highly trained nurses and to improvement in the use of post-operative physiotherapy.

Post-operative feeding in this phase is unimportant. It is a catabolic phase, and only glucose seems usable as a source of calories at present. Riegel²² showed that it is important to have a supply of protein and, if possible, calories available when the patient commences to move into the anabolic phase. She is however of opinion that intravenous sources of this supply should be sought, because, up to this point, a scaphoid abdomen and a sense of thirst are preferable to a large quantity of calorie- and protein-sparers being splashed back and forth in a poorly motile bowel.

The actual size of this problem is very difficult to determine. Taylor and Ancel Keys¹³ made experiments on healthy young adult males under conditions that simulated injury. They confirm findings by Paquin, cited by Taylor and Keys,¹³ that the rate of nitrogen loss is 2-6 (av. 4) g. per kg. body weight per day. Taken over as much as 5 days in a 70-kg. person, this amounts to the nitrogen equivalent of about 5 lb. of the lean-muscle mass. Dehydration can increase this loss up to twice this rate. Inactivity increases the effect of this loss, because not only is the heart muscle losing its substance as one of the larger lean-muscle masses of the body, but it is allowed to get out of condition. The liver loses protein, and so do the large coarse muscles of locomotion, which may account for uncertain balance and weakness if the patient cannot be out of bed by the third day or even earlier, or if he is not taught a proper course of rehabilitative exercises for all his unaffected muscles.

It is worth noting that in acute peritonitis this lean-muscle mass can lose up to 1 kg. per day!

The Second Phase

This phase of normal surgical convalescence is the phase of returned homeostasis and returning anabolism. It commences from the third day onward depending on the interaction of all the factors mentioned so far. In females it is the time of 'the lipstick sign'.¹¹

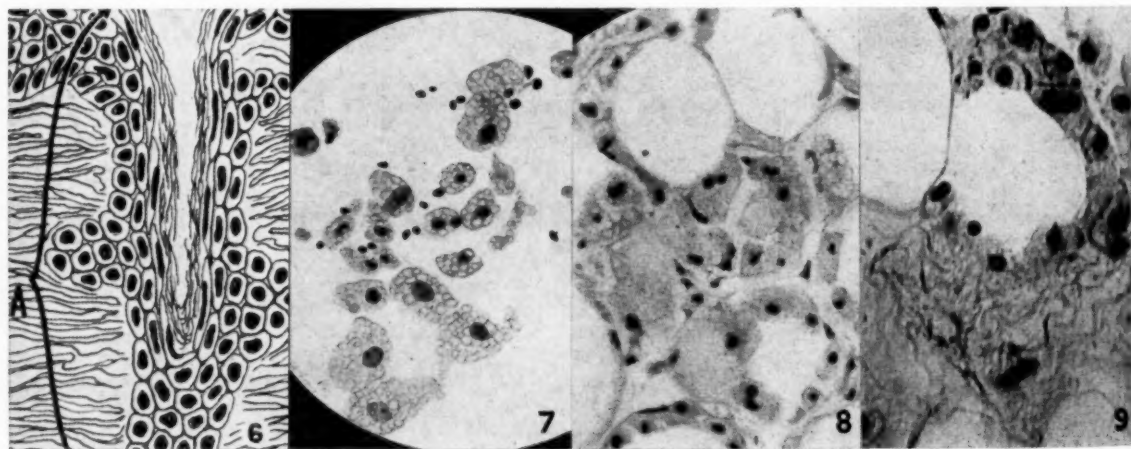


Fig. 6. Epithelialization in the wound (diagrammatic).

Fig. 7. Deposition of small round lymphocytes on fat cells.

Fig. 8. The consumption of fat cells.

Fig. 9. The formation of collagen fibres.

The patient feels better. He suddenly moves much more freely, and the winds of surgical change are to be heard blowing across the ward. His appetite begins to return, his ambitions extend beyond the next hour or two, and his spirit is willing, even if his flesh is still so weak that a 'not-to-be-disturbed' sign turns late arrivals among his well-wishers and visitors.

In the wound itself epithelialization is almost complete by morphallaxis, as already described, and the subepithelial layers commence mitotic division and raise the epithelium to the surface by epimorphosis^{6,14} (Fig. 6).

Tensile strength, which is probably achieved by the coordinated laying down of collagen, and the contraction of the wound, is now becoming apparent.

Collagen appears as follows: Of all the cells that stream into the wound margin, the small round lymphocytes are the commonest. They promptly digest the nearest fat cells, or areolar-tissue cells, and swell and become polyblastic cells, or histiocytes, or macrophages, or possibly so-called primary connective-tissue cells⁶ (Fig. 7). These cells continue to grow by consuming fat cells and then the amorphous coagulum in the wound line (Fig. 8). They grow so large that they rupture, and collagen is laid down all through the wound line and the damaged layers on each side adjoining it. Obviously, any operative dissection of these areolar and fascial planes further than the minimum necessary for the operative approach is biologically harmful to healing. The collagen fibres are actually preceded by fibres of pre-collagen which are visible through the electron microscope, which arrange themselves in echelon and which coalesce about 5 at a time to form the microscopically visible collagen fibres¹⁵ (Fig. 10). Obviously, the more

new repair cells of all sorts are deposited around the framework. As these cells do their work and become effete they

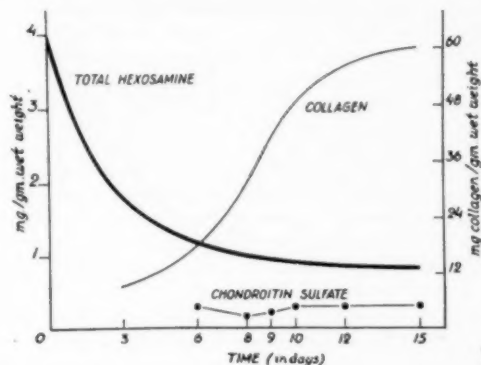


Fig. 11. Hexosamide, chondroitin sulphate and collagen formation in the healing wound.

in turn are consumed by new monocytes, and their polyblastic offshoots, which again swell, burst and form pre-collagen and collagen, but the quality of the pabulum is not as good as it was at first, and the process slows down (Fig. 11).

Negative nitrogen balance does not affect this process.¹⁵ Lack of vitamin C retards it both as to collagen deposition and endothelial ingrowth. Protein starvation, in the clinical sense, affects the processes slightly, if at all, but gross alteration of the serum proteins does interfere markedly by alteration of the osmotic properties of the serum. The reason for this lack of effect may be the fact that sulphur is conserved in protein starvation after wounding. Cortisone in excess does not affect the laying down of collagen, but it does affect contraction of the wound, i.e. the aggregation of this collagen into fibrous bundles which give tensile strength. Thyroxine in excess weakens the tensile strength in the normal closed wound. Irradiation seems not to affect these processes until they are well established and then the effects are those of hypoprothrombinaemia.¹⁵

A wound in a cachectic, toxic person with absolutely no body fat is seldom seen, but it would not be surprising if the absence of fat interfered with the earliest stage of the processes described. 'Well begun is half done' is truer of wounds than of any other state of affairs, as a brief consideration of wound dehiscence will show.

Wound dehiscence is not part of normal convalescence, but it is always interesting and, of course, is used here to emphasize some of the processes referred to from a clinical standpoint.

Wound dehiscence occurs as frequently in the apparently well-nourished as in the apparently cachectic. The time of its occurrence may be altered by suturing methods and a variety of bursting strains, but there is almost certainly some basic deficiency in the promptness of the earliest healing responses which is not understood, but which is overcome by the time re-suture is needed. Prompt re-suture produces a rate of healing which is little delayed, and a quality of healing which shows a relatively greater tensile strength after one week than would normally be expected, according to experimental investigation.¹⁶ In my opinion this effect

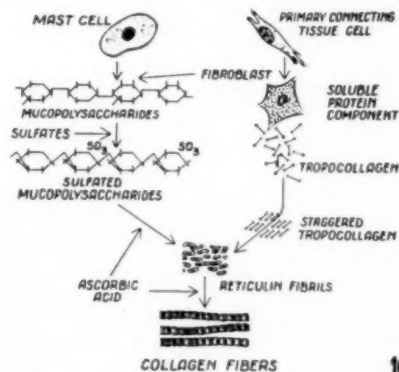


Fig. 10. Hypothetical model of fibrogenesis.

precise the apposition of corresponding layers in the wound and the closer the co-adaptation, the less the wound space (in view of what has been described, it can scarcely be called the 'dead space') and the better the chance to establish tensile strength and anatomical integrity as shown by Le Gros Clark in experiments in muscle suture.⁷

Organization of the collagen depends on the ingrowth of a scaffolding of endothelial cells from the underlying capillaries which are sealed with blood clot. These form capillaries themselves. A blood supply to the wound space commences. New fibrin, new protective polymorphs, and

is enhanced if the wound is re-sutured in one full thickness with no re-dissection of layers, and this may be substantiated by what has been said above. It is also my impression that wound breakdown seems more common in persons who for any reason, possibly chiefly emotional confusion and fear, are putting out an undue share of adrenal medullary secretion, or who are, of course, on cortisone therapy.

A useful clinical feature follows from all this. If re-exploration for any reason must follow recent operation, the original wound should be used. It heals faster,¹⁴ it bleeds less, and the patient is less affected than by a new wound.

Biochemically the antidiuretic effect ceases, and a sodium and water diuresis commences. Intravenous nutrition ceases. Potassium loss ceases. Otherwise the biochemical state is based on the decreasing loss of nitrogen and the absence of a positive nitrogen balance in the absence of an adequate exogenous nitrogen intake. Urinary nitrogen falls to normal, after having been raised to 4 times the normal level.

The clinical management must allow for the loss of up to 150 mg. of protein nitrogen, equivalent to about 2-3 kg. of the lean-muscle mass. As early as possible the daily intake of food must be about 1,500 calories, including about 1.5 g. of protein per kg. of body weight per day. Most patients can start with 40-50 g. of protein, 75 g. of carbohydrate, and 120 g. of fat per day from the third to fifth day. Of course, during the whole convalescence the patient should receive up to 1,000 mg. of ascorbic acid per day, according to Dunphy.¹⁵

The patient is strongly encouraged to increase his ambition, to think positively about the future, to be active, and to eat well.

Activity does not necessarily mean getting out of bed, which may in any case be impossible, but it does mean active physiotherapy, rehabilitative exercises, and if only it were possible, short-term occupational therapy. So simple a device as a strong bandage tied to the foot-rail of the bed will allow the patient to haul himself upright with no strain on his abdominal muscles, which will both encourage him and give him some exercise. A bed-head 'hockey stick and polly-perch' can provide considerable exercise with no strain on the abdomen.

All this exercise uses calories and this must be allowed for. The patient should be allowed to eat as much as he feels inclined to unless there is some severe contra-indication, and in that case it must be relieved as soon as possible.

The Third Phase

The third phase of spontaneous anabolism and the regaining of muscular strength usually commences at about the eighth day. The patient walks fairly easily. Not only is his spirit willing, but his flesh is now stronger. He is fit to go home if the circumstances of his home are good, and his stitches are removed about this time.

In the wound the epithelium is being thickened by epithelial mitosis, as described, and the scar broadens superficially although contraction is occurring in the deep area. As this progresses the wound scar bulges above the surrounding level of skin.

A fascinating problem arises from this process: What stops it? What interrelation of epithelialization, granulation, and the organization of the stromatous ground substance of the wound comes into play to prevent the process

of wound healing continuing and behaving like a sarcoma? Why do wounds not all become keloid?

Dunphy¹⁴ (1958) suggests that in seeking the explanation for the start of the neoplastic process, we should cease to think in terms of the cell only, and that we should pay more attention to the connective stroma around it. He points out¹⁵ that the stoppage of epithelial proliferation and its regression to a normal scar resembles the regression of the epithelium of the breast in carcinoma under the influence of hormone therapy.

This phase of wound healing may in some respects last for a year or longer, as stated earlier, and this far exceeds the period of apparent return to normal general metabolism. In this may lie the explanation of the fact that, although in modern times the patient's initial progress is so much faster, the end point of convalescence is reached after much the same interval as in days gone by.

In fact, human tissue heals by the setting of human glue, and the rate of the reaction has, in normal circumstances, probably remained unchanged since man began. As Iago says:

'How poor are they that have not patience,
What wound didst ever heal but by degree?'

Biochemically the patient is replacing 3-10 g. of nitrogen, equivalent to about 100 g. of lean-tissue mass per day. As he has lost about 2,000 g., this should only take about 20 days. Actually this dietary intake probably does not meet his increased caloric need, and nitrogen replacement lags behind this standard and endogenous fat breakdown continues.

The patient, therefore, benefits from muscular activity, but must use for this only a modest portion of his caloric intake. He may and should return to modest physical work, but there is good ground for telling him to 'take it easy'.

The Fourth Phase

The fourth and last phase of convalescence is the return to normal physical habitus and weight. Little is known about the biochemical activity of mediator mechanisms in this and the previous phase, and the opportunity for investigation is relatively limited. Post-operative weight may be quite well below pre-operative level, because before the operation the patient was eating, consciously or unconsciously, beyond his needs, e.g. in tuberculosis or in taking frequent meals and collations so common in the treatment of duodenal ulcer. This lower post-operative weight may be nearer the true desirable weight for the patient.

CONCLUSION

While passing through this jungle of physiological thought and endocrinal speculation, it is easy to forget to treat the patient as a whole man. Karpovitch¹⁷ in an orthopaedic hospital found that young men on an average halved their recovery time when full use was made of all possible ancillary rehabilitation services such as rendered by occupational therapists, social workers, and physiotherapists. The establishment of an experimental post in each ward similar to that of an air hostess should be worth while. In a teaching hospital the constant ebb and flow of the tide of student and staff rounds relieves boredom to a great degree. We have unsuspected entertainment value for our patients.

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Nevertheless, a patient in hospital suffers for 10% of his time from pain, and for 90% from boredom.^{18,19}

The New York City Hospitals Department is converting areas of certain hospitals no longer required for acute care, e.g. tuberculosis hospitals, into homestead wards, with the emphasis on the recreational, emotional, social, and rehabilitational needs of patients, with a reduction in maintenance costs by over 50%. In 1957, together with Prof. C. E. Lewer Allen, of Cape Town, I made a limited and preliminary study of this sort of approach in Cape Town in the hospitals in the southern suburbs. The average duration of hospital-bed days increased by about 7% compared with 1956. The reason was thought to be the increasing number and increasing severity of traumatic orthopaedic work. Taking this into account and considering also the other types of surgical convalescent patients, it seemed a reasonable conclusion that the establishment of a convalescent or homestead type of hospital consisting of 25 beds for European males, 60 beds for European females and 60 and 30 beds for non-European males and females respectively, i.e. a total of less than 200 beds, would enable the present hospital accommodation for acute cases to cope with the situation and to reduce the large waiting lists to a treatable size. The survey showed that 262 beds were available at that time for the treatment of acute cases.

The daily cost of such beds at that time was 74s. a day for 'acute' beds, and 19s. 8d. for actual existing 'convalescent' beds. The saving effected by creating such an approach would pay a whole body of workers in the ancillary convalescent surgical services.

Howard Rusk²⁰ says of this part of surgical convalescence; 'If man doesn't use his potential, he vegetates. If a patient has work to do, someone interested in him, congenial company, stimulating and competitive tasks, then he has a desire to live and not to be merely alive, and this is essential to endocrinal, emotional, and physical convalescence'. As soon as the second phase commences we must stimulate the will to live.

The cost of idle convalescence in every aspect, from fees paid to hospitals and doctors to the loss of productive gainful employment, far outweighs its benefits. Bartels and Johnson²¹ made a valid comparison of the duration of convalescence in patients of a group of surgeons divided into the following categories: (A) private, chiefly self-employed, patients, (B) military pensioners, and (C) casual seasonal and day labourers. In units of time the groups were con-

valescent in the ratio of 3 : 4 : 3½, when the date of return to work was set by the doctor. When the patient was allowed to go back to work when he himself felt fit, he did so in about 5/8ths of the above times, but the proportions between the types of patient remained about the same, viz., 2 : 3½ : 2, on the same basis of calculation. Those who favour a welfare state will notice that any relative shortening of convalescence within the groups is most noticeable in the private self-employed category.

In conclusion, when we survey the wide field of surgical convalescence and admire the steady progress of investigations into the healing process, by the use of which we may better treat our patients, or better understand some phases of the cancer problem, we can say with Clough, that although we

'Seem here no painful inch to gain,

Far back, through creeks and inlets making,

Comes silent, flooding in, the main.'

I wish to thank the authors and editors concerned for their kind permission to reprint the following figures:

Fig. 1 from Douglas, D. M. (1952): *Brit. J. Surg.*, **40**, 83.

Figs. 2, 4, 6-9 from Hartwell, F. S. (1956): *The Mechanism of Wound Healing*. Springfield, Ill.: Charles C. Thomas.

Figs. 3, 10 and 11 from Dunphy, J. E. (1960): *Ann. Roy. Coll. Surg. Engl.*, **26**, 72, 79, 82.

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FORTHCOMING INTERNATIONAL MEDICAL CONFERENCES

First International Congress on Medical Photography and Cinematography, Dusseldorf, 27-30 September 1960. The official languages of the Congress are English, French and German. The main lectures will be translated simultaneously. A 'photokina' exhibition will be held in Cologne at the same time as the Congress and transport facilities have been arranged. Scientific lectures will include communications on the following subjects: Lighting, optics, ophthalmology, surgery, dermatology, documentation, organization and instruction, emulsions, developing methods, endoscopy, television, projection, legal medicine, photography and cinematography for measuring purposes, photomicrography and cinemicrography, close-up photography and

photomacrography, radiology, medical photography and cinematography at accidents, veterinary medicine and dentistry. Dr. A. D. Bensusan, of Johannesburg, will speak on 'Medical photography in Africa'.

Registration and remittance of fees up to 1 August 1960 will be DM 30,-; after that date DM 40,-. Registration should be completed before 15 August 1960.

Further information may be obtained from Deutsche Gesellschaft für Photographie E.V., I. Internationaler Kongress für Medizinische Photographie und Kinematographie, Neumarkt 49, Köln, Germany.

COARCTATION OF THE AORTA IN ONE OF IDENTICAL TWINS

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Victoria Hospital, Wynberg, Cape

Since identical twins have the same genetic structure, anatomical differences between one identical twin and the other must have an environmental cause, from factors operating either *in utero* or in postnatal life. In the present case, it must be presumed that the lesion occurred during intra-uterine life because of the congenital nature of the lesion and age of the child.

This appears to be the first case to be reported of coarctation of the aorta in one of monozygous twins.

CASE HISTORY

Cheryl is a Coloured* female infant born on 13 October 1958, and was brought to the out-patient department of this hospital on 21 December 1958 because of a mild gastro-enteritis. A cardiac murmur was discovered, and on further examination the signs of coarctation of the aorta. Since she proved to be one of twins, her sister was sent for and the two admitted for investigation.

The twins come 7th in the family, the 6 older sibs all being singletons and in good health. There is no history of twins on the mother's side of the family, but the father has two cousins both of whom have twins, one pair being reported as identical.

The pregnancy was normal, without overt maternal infection, threatened miscarriage or antepartum haemorrhage.

Delivery. The twins were delivered at home, and the midwife noted that there was only one placenta, which was large. Cynthia

was born first, by the vertex, and weighed 5 lb. (2.3 kg.). She was followed 20 minutes later by the patient Cheryl, born by the breech and weighing 4½ lb. (2.2 kg.).

Postnatal period. The twins were breast-fed for the first 4 months, but were then put on to a half-cream milk mixture owing to the failure of the mother's milk supply. Both sucked well, but Cheryl has remained slightly smaller than her sister.

Physical Examination at 5½ months

At the age of 5½ months Cheryl's weight was 6 lb. (2.7 kg.) and she was 23 inches (58 cm.) in length. Cynthia weighed 6 lb. 3 oz. (2.8 kg.) and her length was 23½ inches (59 cm.). They



Fig. 1. Patient Cheryl (left) and her twin sister Cynthia.

* The Coloured race is derived from a mixture of European with Malay, Hottentot, Bantu or Bushman stock.

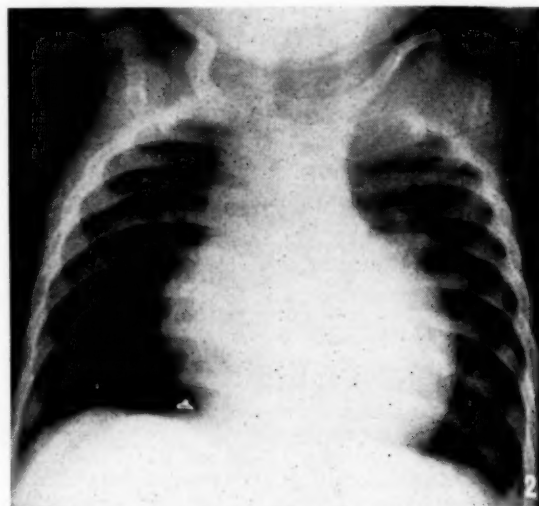


Fig. 2. Cheryl X-ray of chest, showing left ventricular hypertrophy, enlargement of ascending aortic shadow, and well-marked pulmonary bay.

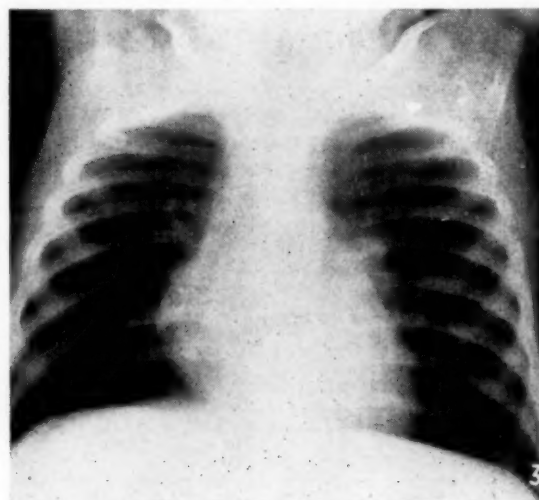


Fig. 3. Cynthia. Normal X-ray of chest.

were very similar in appearance, but it was noted that Cheryl's lower limbs appeared smaller than those of her sister (Fig. 1).

Neither was cyanotic nor exhibited clubbing of the fingers, and there was no evidence of cardiac failure. Except for the marasmus and the physical signs in Cheryl's cardiovascular system, no abnormalities were found (Table I and Figs. 2 and 3).

TABLE I. THE CARDIOVASCULAR SYSTEM

	Cheryl	Cynthia
Radial pulses	115/min., full regular, collapsing.	110/min., regular normal volume and tension.
Femoral pulses	Not palpable.	Palpable, and of comparable fullness and tension with the radials.
Blood pressure: Arms Legs	125/45 mm. Hg. Not recordable.	85/40 mm. Hg. 85/40 mm. Hg.
Heart Apex beat	4th left intercostal space, mid-clavicular line, left ventricular in type.	4th left intercostal space, 1 cm. medial to the mid-clavicular line, normal in character.
Sounds	Normal at apex. P2 split.	Normal. P2 split.
Murmur	Basal holosystolic murmur, conducted into neck vessels.	None.
Collateral circulation	Not demonstrated.	—
Electrocardiogram	Left ventricular hypertrophy.	Normal.
X-ray (Figs. 2 and 3)	Cardiac hypertrophy. Enlargement of ascending aortic shadow, and well-marked pulmonary bay.	Normal.

Evidence of Monozygosity

There was only one large placenta, as vouched for by the midwife.

The features are remarkably similar, the hair is alike in colour and whorl, and the eyes are alike. The ears and lips are similar. The twins have identical blood groups, viz. Group B, ccDee, NNS, K negative, Duffy positive.

The finger prints are dissimilar; Cheryl's are of a whorled nature, whereas the basic pattern of Cynthia's is looped.

DISCUSSION

Narrowing or coarctation of the aorta may occur at any site, but in the vast majority of cases the stenosis lies immediately beyond the origin of the left subclavian artery in close relationship to the ligamentum arteriosum. Two main types are described, as follows:

1. *Infantile type.* Here the ductus remains patent and enters the aorta below the stenosis. The pressure in the distal aorta is so low that venous blood passes from the pulmonary artery into the thoracic aorta, resulting in cyanosis of the lower half of the body, whilst the upper half remains pink. Other congenital abnormalities are frequent, and the condition is regarded as being incompatible with life for more than a few weeks after birth.

2. *Adult type.* In this, by far the commoner, type the

ductus is usually obliterated or, if patent, opens into the aorta above the stenosis. The present case is of this type.

It has been shown that the arch of the aorta is formed by the ventral root of the left 4th arch, by the 4th arch itself, and by the dorsal root of the left 4th arch. The first part of the descending aorta and the ductus arteriosus are formed from the left 6th arch. These developments take place between the 5th and 7th week of intra-uterine life, i.e. between the 9 mm. and 15 mm. stages of embryonic growth. It is probable, therefore, that coarctation of the aorta has its origin at this early stage of foetal development. In the present case, no aetiological factor may be demonstrated for Cheryl's coarctation.

The occurrence of congenital heart disease in one of a pair of twins has frequently been recorded in the literature, but no record of coarctation in the one twin has been found. Jones¹ records 11 cases of congenital heart disease, of which 6 were regarded as being definitely monozygotic and 4 probably so. A further 13 cases, including tetralogy of Fallot, dextrocardia with pulmonary stenosis, atrial septal defect, ventricular septal defect, pulmonary stenosis with a normal aortic root, and primary endocardial fibro-elastosis, may be added from the paper by Uchida and Rowe.²

SUMMARY

A case of coarctation of the aorta in an identical twin is reported. No aetiological factor could be demonstrated.

We wish to thank the Medical Superintendent for permission to publish, and Dr. L. Vogelpoel for the ECG report.

ADDENDUM

The patient Cheryl died suddenly before an arrangement could be made for her admission to hospital for an operation to correct the coarctation. An autopsy was carried out by Dr. W. P. Mulligan, whose report is as follows:

An autopsy was carried out on this child on 22 January 1960 about 36 hours after death. The body is that of a thin underweight child. PM lividity moderate. No rigor mortis noted. Moderate oedema noted.

Cardiovascular system. The heart is moderately enlarged, with marked left ventricular hypertrophy (wall 1 cm. thick). Slight right ventricular hypertrophy noted. Valves normal. No bicuspid aortic valve. A coarctation of the aorta is noted in the arch about 3 cm. from the aortic ring. Here the vessel is 1.2 cm. in diameter. Proximally the aorta is 2.5 cm. in diameter. Coarctation is at the site of the closed ductus.

Dilated arteries coming from the aorta proximal to the coarctation are noted. They are the two innominate coming off together and the left subclavian. The intercostals below the coarctation are small and so are the common iliacs. The foramen ovale is patent, with an opening only 2 mm. in diameter.

Respiratory system. Left lung 70 g. Right lung 85 g. There is collapse of the whole left lower lobe, with bronchial mucus in excess. Subpleural petechial haemorrhages noted.

Gastro-intestinal system. Moderate fatty change in liver.

Genito-urinary system. Normal.

Brain. Normal. No haemorrhage or aneurysm.

Conclusion. Death appears to be due to bronchitis with collapse of the lower lobe of the left lung in a malnourished child with a coarctation of the aorta.

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A NEW APPROACH TO THE TREATMENT OF HERPES ZOSTER

ARNOLD RAFF, *Cape Town*

Herpes zoster is a self-limiting disease which usually runs its course in about 2 weeks. Recovery is usually complete, but now and then the doctor has to deal with an elderly patient suffering from a post-herpetic neuralgia, especially of the supra-orbital ophthalmic type which is probably foremost in severity and intractability.

The neuralgia has been defined as 'the ghost of a herpes zoster which has run its course and cannot find rest'.

Herpes zoster is not commonly seen in my practice, but all of a sudden, within 10 days, 4 patients presented themselves for treatment.

The literature is replete with various treatments, none of which is either specific, or generally accepted. It is interesting to note that good results were claimed by several writers: Appelman¹ used ACTH. Marshall² claimed very favourable results with the topical application of 1% hydrocortisone ointment, and it occurred to me that hydrocortisone injections might be more effective. Hydrocortisone has been proved very beneficial in numerous cases of acute pain, e.g. in 'tennis elbow', periarticular arthritis, bursitis, etc. The problem was which site and what quantity to use, and also the likelihood of side-effects and reactions.

The consensus of opinion seems to be that herpes zoster is caused by a virus, and the inflammatory and infective nature is borne out by the fact³ that the skin eruption is secondary to the affection of one or more bulbar or spinal roots, and the herpetic vesicles are distributed in the precise cutaneous territory related to these roots. The virus is thought to travel distally along the nerves, to be deposited at their terminal endings.⁴ According to Head and Campbell,⁵ 'pain and transient temperature precede the skin eruption'.

It is recognized that hydrocortisone has a favourable effect on inflammatory and oedematous tissues. Experience has taught me that the addition of 2% procaine hydrochloride mixed with the hydrocortisone produces a rapid local analgesia and thus renders the injection quite painless, but hydrocortisone injected by itself into a painful area can produce an acute reaction for 24 hours or so.

The following is a brief account of my experiences with 4 cases:

Case 1

A female, aged 50, consulted me within 36 hours of the appearance of the typical vesicular rash which was on the right side of the chest along the 5th and 6th dorsal nerves. I injected 25 mg. in 1 c.c. of hydrocortisone acetate with 3 c.c. of procaine, first deep into the posterior root near the spines of 5th and 6th dorsal vertebra and repeated the same procedure just proximal to the 2nd crop of vesicles. I decided not to do any block anaesthesia proximal to the 3rd crop of vesicles, because I thought that by blocking the first two areas of vesicles I should arrest the spread of the virus along the nerve path. The result was dramatic; the pain disappeared almost immediately and within 24 hours the vesicles began to form crusts and there was no further outbreak or spread of the herpetic eruption. The patient made an uneventful recovery.

Case 2

A female, aged 60, who had had 'shingles' for about 1 week. She, too, had the eruption on the right side of her chest, but in her case the 5th, 6th and 7th dorsal nerves were involved and she had large eruptions of vesicles all along the distribution of

the subcostal nerves. I decided to do a block anaesthesia of the 5th and 6th nerves only and see what would happen to the 7th nerve which would act as a control. I injected 50 mg. of hydrocortisone in 3 c.c. of procaine in the posterior nerve roots of the 5th and 6th dorsal vertebrae followed by 25 mg. of hydrocortisone acetate in 2 c.c. of procaine along the largest distribution of the herpetic eruption. Here, too, the relief from pain was immediate, except along the distribution of the 7th dorsal nerve which was not injected. The next day the vesicles along the 5th and 6th nerves were painless and rapidly drying up, but the vesicles along the 7th nerve were very much alive and painful. I then repeated the same procedure along the untreated nerve, with complete relief and rapid healing.

Case 3

A male, aged 68, consulted me because of a sleepless night and considerable pain caused by the herpetic eruption which appeared on his chest 24 hours previously. He had an angry-looking rash along the 4th dorsal nerve on the right side. In his case too, I followed the same procedure as in the previous 2 cases, also with dramatic results and a rapid defervescence and healing of the vesicles.

Case 4

A male, aged 72, consulted me because of a post-herpetic neuralgia affecting mainly the right eyebrow. The pain radiated over the frontal bone and spread out in a fan shape towards the sagittal suture of the frontal and the right parietal bones. His attack had occurred suddenly 15 months previously and he had been confined to bed in a local nursing home and had had a variety of treatments which produced only temporary relief. He was in a desperate state and had decided to seek medical advice overseas because he felt nothing further could be done for him in South Africa. One week before sailing for London he consulted me. He looked and felt very dejected because of the acute pain and lack of sleep and the possible danger to his vision. I injected 12 mg. of hydrocortisone acetate with 2 c.c. of procaine hydrochloride into the area of maximal swelling and tenderness over the right supra-orbital ridge. The patient experienced almost immediate relief over the eye, but there was still a good deal of pain in the non-injected areas. The next morning he informed me that for the first time in 15 months he had had a good night's sleep. He had 5 daily injections into the 'trigger' points, the oedema subsided, and he seemed much more comfortable. He appeared again in my rooms after 4 months of absence overseas. It appears that he did not, while in London, have any treatment for his facial herpes zoster, and he came back for more injections because he still had some areas of tenderness over the parietal and frontal regions.

COMMENT

It would appear that the hydrocortisone acetate and procaine hydrochloride seem to have had a beneficial effect both in arresting and relieving the neuralgic pain in herpes zoster.

These 4 cases do not permit of any generalization, but it would be interesting to hear from others of any cases treated by this method on a large and controlled scale. Some workers claim a superiority of prednisolone over hydrocortisone, but I have had no experience with the local injections of prednisolone. I may also state that I did not encounter any side-effects or local reactions from the combined injections. I mix the hydrocortisone in the same syringe with the procaine and I find that 1 c.c. of hydrocortisone acetate combines well with 3 c.c. of procaine. In the above-quoted cases I relied mainly on the block

anaesthesia, but also prescribed local applications of calamine, e.g. caladryl lotion, salicylates, etc., and an occasional sedative to be taken at night, e.g. nembutol, carbital, etc.

SUMMARY

Four cases of herpes zoster are described. They were treated by block anaesthesia combined with a steroid, i.e. hydro-

cortisone acetate. The results seemed uniformly satisfactory and I am of the opinion that the above-described treatment is a valuable aid in the treatment of herpes zoster.

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THE ORDER OF ST. JOHN*

A. B. DE VILLIERS MINNAAR, M.B., Ch.B., M.Ch.

President, Griqualand West Branch, Medical Association of South Africa, 1959

As you all know I have been particularly interested in the activities of the Order of St. John of Jerusalem, and this evening I wish to tell you something about this organization, especially about the early history of the Order.

Like so many other organizations that originated in mediaeval days, the origin of this movement is shrouded in legend. The

idea of a medical organization in Jerusalem is attributed to Solomon, the wisest of all kings, who, after the completion of the temple, instructed his architect Hiram Abif to erect a Muristan—a 'sick house'. According to legend Judas Macabaeus and his nephew Johannes Hyrcanus were the founders of the Order of St. John.

Early History

Historically the origin of the movement is connected with the pilgrimages of Christians to the Holy Land. Palestine, at that time, was in the hands of the Turks who meted out harsh treatment to these visitors. In the year 600, Pope Gregory the Great instructed the Abbot



Dr. de Villiers Minnaar

Probus to establish in Jerusalem a hospice for pilgrims. This institution underwent many vicissitudes and in 1012 was completely destroyed by the mad Caliph el Hakim. Shortly after the Caliph's death in 1023 a group of merchants in the republic of Amalfi in Italy were so moved by the sufferings of the unfortunate pilgrims, that they journeyed to Cairo where the new Caliph resided, and obtained permission from him to maintain a hospital in Jerusalem for the benefit of Christians. This request was granted, on condition that they were also to help Mohammedan sufferers. These people became known as 'The Brothers of the Hospital of St. John'. They bought the site of Charlemagne's hostel, built a hospital, and took on as their crest that of the Republic of Amalfi—the white eight-pointed cross which today still is the emblem of St. John.

The relationship between Turk and Christian varied according to the will of the reigning Caliph. Gradually conditions deteriorated for the Christians, particularly the journey to Jerusalem, which was fraught with dangers from pirates at sea and robbers on land. Many pilgrims lost their lives and eventually access to some of the Holy places were closed to them.

The Crusaders

One of the pilgrims happened to be a man with great zeal for his religion, who, on his return to Europe, championed the cause of the Christians. He was Peter the Hermit. Europe was moved by his eloquence and crowds assembled wherever he went and spoke. Aided by an appeal from the Pope, thousands left their work to form an army for the relief of the Holy Land. They called themselves Crusaders and sewed the distinguishing cross on to their coats. The first Crusade was born, and the expedition

was placed under the command of a French nobleman, Godfrey de Bouillon, Duke of Lorraine.

The invading Crusader army, after capturing several towns and villages from the Turks, eventually reached the walls of Jerusalem and laid siege. Meanwhile, within the city, the hospital fraternity carried on their noble work under the Rector, Gerard, who, by virtue of the respect he commanded, was known as the Blessed Gerard.

Gerard was born in the village of Martigues in Provence. As a young man, filled with deep religious emotion, he also made a pilgrimage to Jerusalem and, after seeing the fraternity at work in their hospital, decided to stay on to assist. In due course he became Rector.

Jerusalem fell to the Crusaders in 1099, and so impressed were they by the work of the hospitaliers that many renounced their martial profession to join the ranks of Gerard. They also renounced their claims to worldly wealth and endowed the hospital with their properties. Gerard now organized his hospital fraternity as a religious order, placed under the protection of St. John the Baptist. He made his followers take vows and invested them with a black mantle, on the left side of which (over the heart) was sewn the large white light-pointed cross. And even today the knights and officials of the Order wear this mantle on ceremonial occasions. Thus in 1113 the Order of the Hospital of St. John of Jerusalem came into existence, and was formally recognized under a Papal bull of Pope Paschal II.

Constant Warfare

Gerard died in 1118, and Raymond du Puy was elected as Rector. Soon after that he adopted the title of Grand Master. Meanwhile the Mohammedans, anxious to recapture the city, were slowly mustering their forces. Du Puy realized that if his Order and hospital were to remain in Jerusalem, and indeed in the Holy Land at all, they would have to fight for their existence. Under his direction the Order took an additional vow, namely to take up arms and fight the enemies of their religion wherever they were to be found. From this time onwards the history of the Order is one of almost constant warfare. They built strongholds all over the Holy Land to protect the routes of the pilgrims, and today the imposing ruins of the Krak de Chevaliers can still be seen north of Tripoli in Syria.

Eventually in 1187 the Mohammedans under Saladin drove the Christians out of Jerusalem. The knights then went to Acre where they built a hospital, and for the next 104 years Acre became the metropolis for Christianity in the Middle East. The history of the Order during these years was, however, a history of constant warfare, with the Mohammedans slowly getting the upper hand. Europe also had become tired of pouring her resources and best soldiers into Palestine. In 1291 the Sultan attacked Acre with an army of 240,000 strong. The defenders were outnumbered, but the fighting was desperate and the surviving remnants of the knights consisted of the Grand Master, John de Villiers, and 6 other knights.

The shattered establishment of the Order found shelter in the island of Cyprus where the King allotted them the town of Limasol. Meanwhile priories of the Order had also been established in Europe. In England the priory was established at Clerkenwell in London, built on 10 acres of land given to the knights by Jordan de Brizet. To Cyprus the European priories sent men and materials to enable the Order to reorganize their affairs. In order to assist

* Valedictory Presidential Address, Kimberley, 25 February 1960.

pilgrims the knights now had to train themselves as sailors, and in their new capacity they met and fought the hostile galleys of the Turk. So successful were they that navigation in the Eastern Mediterranean became comparatively safe.

The Island of Rhodes

The hospitaliers slowly became tired of living under the rule of the King of Cyprus, and their Grand Master, William de Villaret, conceived the idea of capturing the island of Rhodes. He died in 1308, but 2 years later Fulk de Villaret and his knights took the island without serious loss. The occupation of Rhodes lasted for over 200 years. This well-fortified island, close to the coast of Asia Minor, became a true threat to the Mohammedans, and the galleys (or 'caravans' as they were termed) of the knights kept the sea routes clear. The strangest adventure on the island was that of the French knight Dieudonné de Gozon, who, during the Grand Mastership of Elyon de Villeneuve, slew a dragon under the threat of the death penalty and aided by a pair of well-trained 'English bull-dogs'. The young knight's life was spared but he was banished from the Order. However, his humility earned him a pardon, he was reinstated and eventually became Grand Master himself. Several hundred years later a French historian of the Order concluded that the dragon could indeed have been a huge crocodile.

The Mohammedans did not leave Rhodes in peace for long but sent an expedition against the island in 1480. Peter d'Aubusson, the Grand Master at the time, and a man of great military genius, scored a resounding victory against the invaders. In 1522, however, the Turks came back and so prolonged and bitter was the struggle that both sides became exhausted. The Grand Master, Philip de l'Isle Adam, eventually fearing a massacre of the civilian population, capitulated but was given unbelievably honourable terms, and he and his followers could leave the island with their arms and property.

Malta

The hospitaliers now had no settled home and for 7 years had temporary headquarters in Crete and several Italian towns. In 1530, however, the Emperor Charles V granted the island of Malta to the Order, and in the autumn of that year the knights took possession. Their fleet was led by the mighty warship 'Santa Anna' under the command of the Grand Prior of England, Sir William Weston. The knights immediately turned the island into a magnificent fortress and so increased their fleet that they were enabled to fight the Barbary corsairs along the North African coast. In these engagements the skill and daring of Mathurin de Lescut, known as Romegas, came to the fore and, when he captured the largest Turkish galleon, the 'Sultana', with much treasure, Suleiman the Magnificent, the greatest of the Turkish Sultans, decided that matters had gone far enough, and sent an expedition against Malta in 1565. After severe fighting the Turks captured the fort of St. Elmo. The Turkish losses were heavy and their commander, enraged by this state of affairs, decided to decapitate some of the dead knights and to mount their bodies on planks. He then floated them into the main harbour to demoralize the defenders. The Grand Master, however, was angered by this insult. He immediately had the principal Turkish prisoners beheaded and he fired the heads from his guns into the Turkish camp. However, timely relief for the island arrived from Spain and the Turks withdrew. Six years later, at the naval battle of Lepanto, in which the fleet of the Order took part, the Turks were finally defeated.

The defence of Malta was the last of the great warlike deeds of the Order. When peace came the Grand Master, John de la Valette, began the building of the famous city of Valetta which even today is a glorious monument to the Order. Malta remained the seat of the Order until 1798. The Order survived the French Revolution, its traditional philanthropic services being maintained to the full. Its renowned hospital in Malta, one of the wonders and glories of Europe, remained a pioneer of the scientific spirit in medicine and surgery, often in advance of the times.

Historians, men of science, men of research, scholars in every subject, as well as surgeons and physicians were trained in the class-rooms of the University and the wards of the hospital under the encouragement of the Grand Master and the knights. Their beautiful capital city had become a centre of culture as well as of social magnificence.

The knights of the Order had now returned to their original vows as laid down by the Blessed Gerard, and their true spirit and efficiency was brilliantly illustrated in the manner in which they promptly aided the victims of the terrible earthquake in Calabria, Sicily in 1783.

Yet, this historic Order, to all intents and purposes firmly entrenched in Malta, was dramatically broken up by Napoleon Bonaparte. In 1798 the General decided that the Order was altogether too strong for his liking, and he sailed for Malta. The Grand Master, Von Hompesch, was a pious and kindly old man but weak of character. Realizing that his forces were not very strong and fearing the presence of '5th columnists' within his ranks, he attempted no serious resistance. After 3 days the island fell and Napoleon carried off most of the treasures of the Order. Many of the knights abandoned their vows and returned to their estates. A remnant sought refuge in Russia where the Order was taken under the protection of the Czars. This explains why, even today, there are treasures of the Order found in Russia. Thus sadly ended the wealth and splendour of Malta, but, the Order lived on.

Other Countries

In Russia the knights remembered their ancient rule to 'adorn their knighthood with a true charity, the mother and solid foundation of all virtues'. This again proved their salvation. After a brief sojourn they returned to Italy and in Rome in 1834 the 'Sovereign Order of Malta', an exclusively Roman Catholic body, was established. Today it still has its headquarters in Rome, with priories in Italy, Austria, Spain, Great Britain, and in many other countries, where its representatives maintain hospitals and carry on other charitable works.

In England, after its foundation in 1148, the priory also laboured under difficulties. In 1381 during the Wat Tyler Rebellion peasants burnt down the priory at Clerkenwell and little but the walls survived the flames. The Grand Prior, Sir Robert Hales, was beheaded. Shortly afterwards and before the end of that century the priory was rebuilt. In 1540, however, King Henry VIII, after a quarrel with the Church of Rome, dissolved the order by Act of Parliament and confiscated its estates. In 1557 Mary reinstated the Order, but Elizabeth I, shortly after her accession to the throne in 1558, again confiscated its estates. Strangely, however, the Order was never formally dissolved, and the Royal Letters Patent issued by Mary were never revoked. Legally, therefore, the Order remained in existence in a dormant state until its revival in 1831. In 1871 it settled down in its old home, Clerkenwell, now known as St. John's Gate. In 1877 the St. John Ambulance Association was founded, the primary object of which was the instruction of persons in first aid and home nursing. In December 1882 after a lapse of 694 years the Order returned to Jerusalem to re-establish the hospital which gave it its name. Subsequently it became an ophthalmic centre, and today it still exists, renders yeoman services, and is being maintained by the Order. In 1887 was founded the St. John Ambulance brigade which consists of a body of certificated members who give voluntary service in a wide field of first aid and auxiliary nursing. Thus we see established the three avenues of service of the Order, as we know it today.

In 1888 Queen Victoria was so impressed by the work of the Association that she took the Order under her protection and granted it a Charter. She became the patron and sovereign head of the Order and the Prince of Wales was installed Grand Prior. This has been the practice ever since.

Today the Order still maintains its three avenues of service in the spirit of the words of the Blessed Gerard: '*Pro utilitate hominum*'.

IN DIE VERBYGAAN : PASSING EVENTS

Prof. J. H. Louw, Professor of Surgery at the University of Cape Town left for London, on 4 July, where the Fellowship of the Royal College of Surgeons of England will be conferred on him.

The Fellowship was granted to Professor Louw at a meeting of the Council of the College held in London on 14 April. While in London Professor Louw will attend a meeting of the British

Association of Paediatric Surgeons where he will read a paper on 'Acute osteomyelitis—with special reference to the neck of the femur'. Professor Louw will return to Cape Town on 17 July.

Dr. A. N. Sacks, of East London, has been accepted as an Honorary Member of the British Society of Medical Hypnotists.

Dr. and Mrs. R. L. Kleinman have recently returned to Cape Town after a 4-month holiday visit to Britain and the Continent. Dr. Kleinman assumed his post as Assistant Editor of the *Journal* on 1 July.

South African Institute for Medical Research, Johannesburg, Staff Scientific Meeting. The next meeting will be held on Monday 18 July at 5.10 p.m. in the Institute Lecture Theatre. Dr. H. B. W. Greig will speak on 'Studies on fibrinolysis, with particular reference to the role of lipids'.

South African National Tuberculosis Association. His Excellency the Governor-General, Mr. C. R. Swart, has graciously consented to become Patron-In-Chief of SANTA.

Dr. Maurice Joseph Broderick, who has held the position of National Secretary of SANTA for the past 7 years, is to retire because of ill-health. Dr. Broderick will, however, act as medical consultant to the Association for at least a further year.

Dr. Broderick, who is 65, was born in County Dublin, Ireland, and educated at Clongowes Wood Castle. He qualified at the Royal College of Surgeons, Dublin, and after service in the RNVF during the First World War, practised in Dublin for 10 years before coming to South Africa. During the Second World War Dr. Broderick saw service in the SAMC in East Africa, Egypt and Italy with the rank of Colonel and commanded the 108 South African General Hospital in Italy. On his return to South Africa he was appointed Deputy Director of Medical Services in the Union Defence Force. Dr. Broderick is regarded as an expert on tuberculosis and took a special interest in the subject even during his student days in Dublin. He has always been a keen horseman and was until recently Chairman of the Transvaal Polo Association.

Dr. Broderick will be succeeded by Mr. Clive Herbert Greathead (35), an accountant, who was educated at Jeppe Boys High School and has been Assistant National Secretary of the Association for 4 years.

Dr. Derek M. Jowell, anaesthetist, of Cape Town, has changed his residential telephone number to 71-6768. This number does not appear in the current Telephone Directory.

Dr. Hyam Isaacs, of Johannesburg, has recently returned from England, where he has been studying various metabolic aspects of muscle disorders, and will soon commence practice as a na endocrinologist.

IN MEMORIAM

JAMES DONALD STRACHAN, B.A., M.B., Ch.B. (CAPE TOWN)

Dr. Nico van der Merwe, of Cape Town, writes:

Dr. James Donald Strachan died very suddenly on 15 May 1960 after a brief illness lasting only a few hours, at the age of 55 years. Dr. Strachan was the son of Scottish parents. His



Dr. Strachan

father, the late Dr. P. D. Strachan, who held the posts of Superintendent of the Botsabelo Lepet Asylum, in Basutoland, and lecturer in anatomy and physiology at Fort Hare College, was a well-known doctor.

Donald was born in Philippolis, Orange Free State, on 28 January 1905. At the age of 9 years his family returned to Scotland, where he was educated. He returned to South Africa in 1921 and in 1924 received a B.A. degree at the University of Cape Town. He then became a reporter on the staff of the *Cape Argus*. In 1926 he completed a Teacher's Diploma course and subsequently occupied various teaching and lecturing posts with distinction and devotion, including 5 years at St. Chad's in Natal.

An outbreak of malaria at St. Chad's rekindled his earlier interest in medicine. He decided to study medicine and graduated M.B., Ch.B. in December 1938.

After the usual housemanship appointments, he joined the Basutoland Medical Service and was posted to Mokhotlong. He enlisted for active service in 1941, serving until 1945. After a short return to Basutoland, he joined the Cape Town Municipal Medical Service. He was the first medical officer to be appointed to the Zwelitsha Health Centre, King William's Town.

In January 1949 he once again joined the Basutoland Medical Service, remaining there until he retired in September 1959. During this time he served a further 2 years at Mokhotlong, being the only medical man who worked at this remote and inaccessible station for 3 years in all. He was also posted to Quthing and Mafeteng.

After retiring, he joined the staff of Brewelskloof Sanatorium, Worcester, as Senior Medical Officer, and was enjoying the work, the settled life, and their newly acquired home, when the end came so suddenly.

His work in Basutoland was often hard and rigorous. It was from his wife and mutual friends that I learned of his long and hazardous trips on horseback, often in the snow, often lasting all night. He tackled any emergency courageously, and became an able and capable surgeon, often working under very difficult conditions. He himself spoke only of the beauty and isolation of the Basutoland mountains, which he loved. All his life he remained a keen mountaineer. Once encouraged to talk, he could tell most entertainingly of the land, the people, their hopes, and their ills. He had a keen interest in Native life and helped many a promising young Basuto to acquire a higher education.

Donald Strachan was an exceptionally gifted and cultured man, with wide interests, especially in music and art. He was an avid reader, and kept this up under all conditions. His good presence and gentlemanly qualities always commanded respect. Under his shy and retiring exterior was a warm and affectionate personality, enhanced by a truly delightful sense of humour, and a ready wit, that never hurt his fellow men.

His stamina was remarkable; he was often dogged by ill-health and had to undergo several major operations, once having to be flown from Mokhotlong to Durban, but he never complained. Even when he himself realized the seriousness of his last, acute and fatal illness, he tried to reassure his wife.

His wife, Miss Lucy Fisher, of Cape Town, to whom he was married in 1948, shared many of the rigours of his life, and encouraged and sustained him devotedly. We tender her, his two sons, his mother and his two brothers, our sincere sympathy. We miss him sorely.

UNIVERSITEITSNUUS : UNIVERSITY NEWS

UNIVERSITY OF THE WITWATERSRAND : EXAMINATION RESULTS

The following candidates have completed all the requirements of the Sixth Professional Examination for the degree of M.B., B.Ch.:

Been, H. Cohen, A. S. Cohen, S. G. Ditira, S. S.

Esrock, J. Felgate, E. J. Gershater, M. Gordon, D. E. Mjali, S. J. Mokgethi, P. K. Van Druten, L. F. Wood, E. R.

UNIVERSITY OF CAPE TOWN : EXAMINATION RESULTS

The following postgraduate degrees were conferred at the Graduation Ceremony held at the University of Cape Town on 24 June 1960:

Degree of Doctor of Medicine: F. Benjamin, M.B., Ch.B.
J. D. L. Hansen, M.B., Ch.B.

Degree of Master of Medicine (Paediatrics): C. R. Rainier-Pope, M.B., Ch.B.

Degree of Master of Medicine (Pathology): C. E. Watson, B.Sc. (Hons.) (Rand), M.B., Ch.B.

Degree of Master of Medicine (Surgery): P. S. Willers, B.Sc. (Stell.), M.B., Ch.B.

NUWE PREPARATE EN TOESTELLE : NEW PREPARATIONS AND APPLIANCES

ALDACTONE

Keatings Pharmaceuticals Ltd. introduce Aldactone (spironolactone), manufactured by G. D. Searle & Co., and supply the following information:

Aldactone is the first specific aldosterone-blocking agent for the treatment of intractable oedema associated with congestive heart failure, hepatic cirrhosis, nephrotic syndrome, and idiopathic oedema.

Aldactone provides a new class of therapeutic agent, blocking an altered physiological mechanism which has caused excessive sodium and water retention, thus achieving diuresis.

A distinct advantage of Aldactone in treating oedema is its ability to conserve potassium during diuretic therapy. When given as the sole agent, Aldactone averts the hypokalaemia often induced by mercurial and thiazide diuretics and, when given in combination, largely or wholly offsets the potassium loss which they induce.

It is fully expected that Aldactone will change present medical concepts of the therapeutic limitations in the management of oedema. Many patients living in a greater or lesser state of oedematous invalidism can now become oedema-free. To others gravely ill, Aldactone will be life-saving. Clinical trials demonstrate that, when used as the sole agent acting on the kidney in the relief of oedema, Aldactone will produce a satisfactory diuresis in about half of those patients whose oedema is intractable to conventional diuretics.

Furthermore, when Aldactone is used in conjunction with a mercurial or thiazide diuretic, the level of satisfactory response may be expected to rise to approximately 85% in those whose condition was refractory to all previously available therapeutic measures.

The response of some patients with very resistant oedema may be further enhanced by administering a glucocorticoid such as prednisone. When Aldactone is used in such a comprehensive therapeutic regime, diuresis and relief of oedema may be expected in more than 90% of oedematous patients who would not otherwise respond.

Dosage. For most adult patients the optimal dosage of Aldactone, brand of spironolactone, is 400 mg. daily in divided doses. Aldactone should be administered for at least 4 or 5 days before appraising the response, since the onset of its therapeutic effect is gradual when the drug is used alone. When used in combination with mercurial or thiazide diuretics Aldactone manifests greater activity on the first and second days. The dosage range is 300-1,200 mg. daily and dosage should be adjusted to the response of the patient. A dosage of 400 mg. daily, however, will meet the requirements of most patients.

Supply. Aldactone is supplied as compression-coated yellow tablets of 100 mg.

Further information may be obtained from Keatings Pharmaceuticals Limited, P.O. Box 256, Johannesburg. (Telephone 23-6591.)

CLORPACTIN WCS-90

Westdene Products (Pty.) Ltd. announce the introduction of Clorpactin WCS-90 manufactured by the Guardian Chemical Corporation, of America, and supply the following information:

Clorpactin WCS-90 (monoxychlorosene) is the nearest approach to the ideal antiseptic which has so far been discovered. Both its liquid and vapour phases are lethal to every single known organism whether bacteria, fungus or virus. Even thermophilic spores are killed within 1 minute and destruction of any simple organism such as *Staphylococcus aureus* takes place in a matter of seconds. Clorpactin WCS-90 is also completely effective against *M. tuberculosis*, *S. pyogenes*, *B. pyocyaneus*, *B. anthrax*, *B. coli*, *Trichomonas vaginalis*, salmonellae, shigella, *P. vulgaris*, *H. pertussis*, brucella, *Proteus vulgaris*, etc., as well as yeast and fungi, etc.¹ yet there is complete absence of toxicity, irritation or sensitization. In addition, Clorpactin has pronounced deodorant and penetrating properties.

Clorpactin is a purified grade of an organic hypochlorous acid derivative, buffered and stabilized and supplied in the form of a white, water-soluble powder. It is now available in boxes of 5 vials each containing 2 g. For use, the contents of one 2 g. vial are usually dissolved in 500 c.c. of lukewarm distilled or tap water (0.4% solution). Solutions are rapidly de-activated by exposure to organic solutions and discharges, so that adequate quantities must always be brought into frequent contact at the desired site of action. Copious amounts of Clorpactin WCS-90 solution should therefore be flooded as frequently as possible over the entire area either with a syringe or by means of gravity flow.

Clorpactin has been found to be extremely effective for skin preparation before surgery; to reduce the incidence of post-operation infection;² for impromptu bowel cleansing and sterilization;³ for routine bladder irrigations;⁴ for trichomonas, monilia, and other infections of the vaginal tract, for many ENT cases;⁵ and for oral surgery, etc.⁶

Clorpactin WCS-90 should not be used for surgery involving tumours or cancer. Clorpactin XCB is suggested for these cases.

Further information may be obtained from the sole South African distributors, Westdene Products (Pty.) Ltd., P.O. Box 7710, Johannesburg.

- Swanker, W. A. (1955): *Amer. J. Surg.*, 19, 44.
- du Val, M. K. and Howard, F. H. (1960): *Surgery*, 57, 210.
- Gliedman, M. L. et al. (1958): *Ibid.*, 43, 282.
- Graham, S. D. (1959): *J. Urol.*, 82, 322.
- Zwerling, M. (1955): *A.M.A. Arch. Otolaryng.*, 62, 157.
- Cohen, M. M. (Boston) et al. (1956): *Oral Surg.*, 9, 615.

NEUTRATE

British Drug Houses announce the introduction of Neutrate tablets, which contain an aluminium hydroxide-magnesium carbonate co-dried gel, manufactured by an entirely new process (Brit. Pat. 812503), and supply the following information:

Indications. Neutrate tablets are indicated in the management of occasional dyspepsia, hyperchlorhydric dyspepsia, heartburn, peptic ulceration, and benign oesophageal ulcer.

Advantages. Neutrate tablets provide in stable form a rapid yet prolonged-acting antacid. They are considerably more effective than dried aluminium hydroxide gel B.P., either alone or in mechanical admixture with aluminium hydroxide B.P. 'Neutrate' tablets are stable, no loss of neutralizing action occurring either in processing or storage. The preparation also has no laxative

or constipating effect and does not give rise to alkalosis. Inhibition or normal peptic activity is not induced and Neutrate tablets do not cause 'acid rebound'.

Packing. Peppermint-flavoured tablets each containing 0.375 g. of aluminium hydroxide-magnesium carbonate co-dried gel, supplied in cartons of 40 and 200, foil-wrapped tablets.

Further information may be obtained from British Drug Houses (South Africa) (Pty.) Ltd., P.O. Box 372, Johannesburg.

PERITRATE 80 MG.

Warner Pharmaceuticals (Pty.) Ltd. announce the release of a new form of peritrate, Peritrate 80 mg. Sustained Action tablets. Peritrate Sustained Action tablets are dual-layered tablets, the dark green layer containing 20 mg. of PETN for immediate disintegration and the second layer specially prepared in a wax vehicle with 60 mg. of PETN disintegrating over the next 6-7 hours.

The advantage of the Peritrate Sustained Action form is that only 2 tablets daily need be given in order to give the patient true, 'round-the-clock' protection. The patient is therefore protected against coronary insufficiency in the early hours of the morning when protection is not usually maintained by other forms.

Like other forms of peritrate, the new Peritrate Sustained Action is indicated for angina pectoris, coronary insufficiency, and the post-coronary syndrome. Peritrate Sustained Action will reduce nitroglycerine dependence, reduce pain, increase exercise tolerance and frequently improve ECGs.

Dosage. One tablet *b.d.* at least a half-an-hour before breakfast and dinner.

Peritrate Sustained Action is available in bottles of 25 and 100. The price to the public is 20s. for 25 tablets.

Further information may be obtained from Warner Pharmaceuticals (Pty.) Ltd., P.O. Box 1718, Cape Town.

BOEKBESPREKINGS : BOOK REVIEWS

PLANNING OF STATISTICAL SURVEYS

Medical Surveys and Clinical Trials. Edited by L. J. Witts, C.B.E., M.A., M.D., Sc.D., F.R.C.P. Pp. x + 328. Illustrations. English price 35s. London, New York, Toronto: Oxford University Press. 1959.

'In therapeutic trials in which controls are used, significantly fewer treatments are considered to be successful than when no controls are used' (page 111). War on 'clinical impression' and 'in my experience'. The British teaching hospital system has largely fostered *ex cathedra* announcements by all-knowing chiefs, yet caution has slowly spread, perhaps down from the north, and it is in keeping with the British personality that systems of exact analysis of therapeutic methods should emanate from Britain.

This book really tells you about ways of conducting surveys of prevalence and incidence, and therapeutic trials which require the statistical method. Before anyone decides to embark on a piece of work to establish the relationship of fleabites to peptic ulcer, the incidence of jaundice in railway workers, or the value of extracts of rhinoceros urine in asthma, he should consult this book. For example, he may not realize that, by correct design, in a factorial type of experiment, the importance and interaction of several different factors may be examined in the same trial. This is in contrast to the old method of varying only one factor at a time. Or again, by sequential analysis a study may end as soon as a significant result is achieved, in contrast to the conventional plan of studying a set number of subjects with final assessment of results.

In places, the ordinary clinician who is interested in truth will find the language a little obscure and even verbose. He will find very little here on methods of using patients as their own controls (e.g. in assessing the value of 'tablets' in the treatment of diabetes). There is one further criticism: the statistical result is not necessarily the whole answer. The British are perhaps becoming too prone now to accept it as such. Thus, a carefully-conducted M.R.C. trial of corticosteroids in exophthalmos found these to be of no real value, but what they really found was that *in the dosage they adopted, and in the type of patients* in their study, no statistical advantage could be shown.

Anyhow, this book is most necessary.

W.P.U.J.

RADIOGRAPHIC TECHNIQUE

Medical Radiographic Technique. 2nd edition. Prepared by Technical Service X-ray Department, General Electric Company, under the original editorial supervision of the late G. W. Files. Pp. 386. Illustrations. 82s. 6d. Oxford: Blackwell Scientific Publications. 1959.

This book supplies the needs of radiographers working for a diploma. It embraces physics and electrotechnics as applied to X-ray equipment and includes sections on anatomy and clinical radiography. That it originated in notes intended for technicians of the General Electric Corporation is quite clear, since the treatment of electrotechnics and the physics of radiation is extremely good. Chapters on tomography, high-kilovoltage radiography, soft-tissue radiography and photofluorography are also very well

done. Dark-room lay-out and procedure are included, but unfortunately there is no discussion of silver recovery processes.

The anatomy section is well illustrated and the text fairly complete. It is in the field of clinical radiography that the book is perhaps a little weaker. Examination candidates will expect more than the routine views illustrated. There is not the completeness expected of a work of reference or of a text-book and there are also surprising omissions, such as dental radiography and foreign-body localization as applied to the eye. Many of the procedures with contrast media are very cursorily described, perhaps because a radiologist usually supervises the examination. On the other hand, radiographers will be grateful for the excellent discussion on diaphragms and grids, stereoscopes, etc.

Radiologists who are candidates for a diploma will also appreciate this book. Practising radiologists will refer to it in order to understand what the X-ray service man is trying to explain to them.

The standard of book production is extremely high.

L.W.

VIRAL AND RICKETTSIAL INFECTIONS

Viral and Rickettsial Infections of Man. 3rd edition. Edited by Thomas M. Rivers, M.D. and Frank L. Horsfall, Jr., M.D. Pp. xviii + 967. 134 illustrations. 63s. net. London: Pitman Medical Publishing Co. Ltd. 1959.

It is 6 years since the 2nd edition appeared. The knowledge of viral and rickettsial infections has advanced to such a degree during this time that the book has had to be rewritten for the 3rd edition. This has been done with the help of additional eminent contributors, who now total 44. Each has been chosen as being an authority in his particular field.

It has been necessary to rearrange the material and introduce additional chapters. The growing importance of biochemistry and biophysics is emphasized. There are new chapters on the recently discovered ECHO viruses and adenoviruses, and also on the arthropod-borne animal viruses and their infection of man.

The recently recognized entity of haemorrhagic fever is covered in a new chapter.

Various aspects of poliomyelitis are now dealt with in 3 chapters instead of one.

As previously, all aspects of viral and rickettsial infections are covered, and the book will continue to have wide appeal. This will, no doubt, be aided by its subsidized price.

W.B.B.

PAEDIATRIC ELECTROCARDIOGRAPHY

Pädiatrischer EKG-Atlas. Von Priv.-Doz. Dr. W. Heck und Dr. J. Stoermer. Pp. xvi + 230. 181 Abbildungen in 228 Einzeldarstellungen und eine Messtafel zur Bestimmung des Vektors und zur Ausmessung der Herzfrequenz. Ganzleinen DM 78.00, Stuttgart: Georg Thieme Verlag. 1959.

With the recent advances in cardiac surgery, early and exact diagnosis of congenital heart disease is more important than ever. In this, electrocardiography, being technically simple and completely safe, has its undisputed place. In judging the abnormal,

however, a knowledge of the normal is required. The book under review fills a gap in this respect.

After a short introduction, in which the peculiarities of the ECG in infancy and childhood are set out, vectorcardiography, intrinsic deflection, the electrical axis, and the anatomical differences of the heart and thorax in infancy and their influence on the ECG, are shortly but clearly explained.

In the main chapter of the book, which fills the abovementioned gap and presents an important contribution, minimal, mean and maximal normal time values are given for every deflection of the graph, and times for the following age-groups: Premature babies, 1st and 2nd months, 3-5 months, 6-12 months, 2-3 years, 4-6 years, 7-10 years and 11-15 years. The times given for each group represent the average of 50 clinically healthy individuals completely examined.

In the atlas part of the book will be found typical abnormal ECGs of most of the more important clinical conditions where they are found, including the ECGs of all congenital heart diseases, and also short anamnestic notes and collateral examinations. All findings are confirmed by operation or autopsy.

The book is beautifully printed and certainly of great value—for only for comparison or reference—to the non-German paediatrician specializing in cardiology. W.G.H.

TISSUE TRANSPLANTATION

Transplantation of Tissues. Vol. 2. Skin, Cornea, Fat, Nerves, Teeth, Blood Vessels, Endocrine Glands, Organs, Peritoneum, Cancer Cells. Edited by Lyndon A. Peer, M.D. et al. Pp.

xiii + 690. 252 figures. \$20.00 and 160s. Baltimore: The Williams and Wilkins Company. London: Baillière, Tindall and Cox Ltd. 1959.

The first volume of *Transplantation of Tissues* was published in 1955, and was enthusiastically received. This volume, though similarly patterned, deals with a wide variety of transplants and is therefore of necessity a group presentation. Each subject is dealt with by a specialist in his particular field, which ensures the most up-to-date and authoritative treatment of each section.

The contributors describe, in the simplest of terms, how tissues, organs or glands may be grafted, and the success, limitations or failure of the procedures. Though possibly regarded by many general practitioners as somewhat impractical, this subject is shown to be the exact opposite in these valuable contributions, which arise from present-day studies of cell behaviour. One of the most recently developed branches of medicine, this is also one of the most interesting and topical.

In this volume, experimental research on animals and the clinical application to humans is separate. The book is profusely illustrated, both by photographs and diagrams, in excellent plates of great clarity. Each chapter is concluded with a bibliography.

The purpose of this book is to acquaint the uninitiated with the essentials of the transplantation of tissues, and this is ably achieved with just the right modicum of specialized technical terms. Both volume 1 and volume 2 will be a valuable addition to the book shelves of any medical practitioner, and a source of more and more frequent reference as this field of medicine receives wider and more general acceptance and application. C.N.B.

BRIEWERUBRIEK : CORRESPONDENCE

THE MEDICAL PROFESSION AND THE LAY PRESS

To the Editor: I and the Executive Committee of my Association read with great interest the reports of the recent proceedings of the South African Medical and Dental Council and the Federal Council of the Medical Association of South Africa concerning the reporting of medical matters in the lay press.

I should like to draw the attention of your readers to the fact that this Association was formed more than a year ago with the main object of stimulating accurate, responsible and ethical reporting of all scientific matters including medicine in all its branches.

The Association has about 25 members including accredited science correspondents, journalists, scientists, members of the medical profession and others who regularly write about scientific subjects. Since its inception the Association has held a number of meetings, all of them well attended by members of the medical profession in Johannesburg, to further these objects.

For some time there has been a reluctance on the part of some members of the medical profession to give news or even to speak to accredited journalists representing the lay press. This is clearly evinced from some of the remarks made at the 71st meeting of the South African Medical and Dental Council.¹ I should like to point out that reports and articles by members of our Association are almost invariably referred back to the practitioners concerned and to the Southern Transvaal Branch of the Medical Association to ensure their accuracy and ethical correctness.

All members of your profession must surely agree that there is a tremendous public interest in the development of medical science. To cater for this there has arisen a specialist journalist who writes solely about scientific matters. Most Johannesburg newspapers have now appointed full-time scientific correspondents. Their stories are distributed to almost every daily newspaper in the Union through syndication and the South African Press Association. Surely the fullest cooperation of the medical profession would be the best way of ensuring that these articles are of a standard which the medical profession would like to see?

It is hoped that in the future a greater liaison between science correspondents and the medical profession will develop. But this can only come about when the medical profession accept the situation and endeavours to take a more active part in controlling it.

We should always be happy to hear the views of your members on these matters.

Roy W. Terry
Chairman

The Science Writers' Association of
South Africa
P.O. Box 1138, Johannesburg
20 June 1960

1. South African Medical and Dental Council, Report (1960): S. Afr. Med. J., 34, 405.

NAUDÉ APPEAL FUND

To the Editor: I enclose a list of contributors who have recently subscribed to the Naudé Appeal Fund through the very stout efforts of Dr. M. J. Goddefroy, of Bloemfontein. The total sum collected amounted to £175 17s. 0d. and I can assure you that the Branch greatly appreciates this effort.

We consider it advisable that the names of doctors who kindly donated towards the Naudé Appeal Fund should receive recognition through the *Journal*, and it is for this reason that the list is enclosed:

Drs. C. Albertyn, G. H. Allibone, B. Aronson, Rex Busschau, D. C. J. Carter, P. Connan, R. N. Cullinan, S. Daiklikar, J. Gerber, Beck de Villiers, R. S. Deane, J. F. Krige, P. E. Dreyer, C. V. du Toit, T. B. Enslin, Von W. Eybers, P. M. S. Fischer, T. B. Forrest, W. Gordon, A. J. Groenewald, W. Grundill, G. H. H. Hattingh, E. Hesselberg, I. Hirschfield, C. M. Immelman, A. W. Jacobsz, S. M. Kahn, I. G. Key, Otto F. A. Krause, N. H. Louw, J. D. Meyer, A. G. M. Morrison, J. G. Muller, L. H. Muller, S. W. Nolte, Ian Pepper, P. le R. Pohl, I. J. Roy, I. Sacks, Neville Sacks, F. P. Scott, R. H. Scott, G. H. Sheldon, G. W. Snyman, J. G. W. Sutherland, R. J. Tahan, G. C. Borggreve, Raymond Theron, J. G. Thomson, G. L. Trichardt, L. C. Trichardt, D. J. van den Heever, Nak van der Merwe, J. W. van der Riet, F. van Schouwenburg, J. H. J. van Vuuren, J. J. Viljoen, J. S. Visser, J. H. W. Wessels, M. H. Wessels, S. J. Wicks, M. J. Goddefroy, W. J. Serfontein, S. V. Potgieter, G. B. Lapinsky, J. de V. Joubert, I. Venter, P. J. Neethling, J. S. Pretorius, J. W. Wessels, Koos Theron, D. H. Thomson, J. S. Theron, and A. T. Neser, all of Bloemfontein, O.F.S., and Dr. B. Birch of Engcobo, Transkei.

J. H. Hofmeyr
Hon. Secretary

Transkei Branch (M.A.S.A.)
P.O. Box 318
Umtata, Cape
1 June 1960